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A MODEL OF COMPELLED NONUSE OF INFORMATION

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A MODEL OF COMPELLED NONUSE OF INFORMATION

by

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I dedicate this work to my parents.

[KEYWORDS: CNI; compelled nonuse of information; nonuse of information; VNI; volitional nonuse of information; CUI; compelled use of information; VUI; volitional use of information; abduction; retroduction; Peirce, Charles Sanders; prejudice; pragmatism; American pragmatism; somatic barriers; intrinsic somatic conditions; socio-environmental barriers; authoritarian controls; cognitive barriers; threshold knowledge shortfall; attention shortfall; information filtering; Hofstadter, Richard; anti-intellectualism]

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My faculty advisors.

I am blessed. My first dissertation topic had encountered insurmountable barriers, and my academic career seemed about to end. Then, **Dr. David Gracy** uttered the fateful words: "What BOTHERS you about information science?" Ten minutes later, I had a viable dissertation topic. "There's many a miss 'twixt the thought and the diss," and I am forever grateful to **Dr. Glynn Harmon** for speaking so adamantly in defense of my continuing as a doctoral student. Then, the incredibly capable and erudite **Dr. Philip Doty** offered not only to remain on my academic committee, but also to chair my dissertation committee, and I was back in school for the duration. Faculty members from other departments refused even to set appointments to talk to me, and I feel blessed that **Dr. Diane Schallert** accepted the position of outside faculty member and, with uncanny prescience, guided my reading in extremely fruitful directions. In a school that regularly overworks its faculty, I was then incredibly fortunate to have **Dr. Lynn Westbrook** join the committee at a particularly difficult moment in the search for a methodology. Dr. Westbrook also brought subject expertise and further guided my reading. I had drifted out of Dr. Gracy's subject areas by this time, and **Dr. Bernard Lukenbill** generously stepped in to fill out the dissertation committee, contributing his expertise about the theoretical underpinnings of the study.

My family.

While many people encouraged me, my mother, **Maude Eileen Cardwell, Ph.D.**, inspired me to pursue the doctorate. Only those who hold the Ph.D. degree can appreciate its true uselessness, yet she infallibly provided gentle support and encouragement without condemnation when I faltered. She helped me through academic struggles for years and introduced me to the concept of anti-intellectualism long before Hofstadter wrote his groundbreaking book on the subject. I am sorry that my mother was not allowed to live to see the completion of this dissertation.

I could not have continued in school without the support of my father, **David Lipscomb Houston**, and his wife, **Harriet Saunders Houston**. Life is just too complicated to be lived alone, and their guidance and economic and emotional support made possible any success that I have had.

I suppose that some people expect their dissertations to hold back the forces of ignorance. Having studied nonuse of information quite extensively now, I am exceedingly pessimistic that this dissertation will hold back anything other than a bookend. Instead, I continued this dissertation study as a model for my wife, **Tatiana Nikolova-Houston, Ph.D.**, and for my daughter, **Tatiana "Tani" Denitza Nicole Cardwell Houston**. Tatiana finished her dissertation before I did, providing a much-needed model for me (!), but both have my thanks for the motivation.

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A MODEL OF COMPELLED NONUSE OF INFORMATION

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ABSTRACT

The philosophical and empirical study reported here developed from the observation that information science has had no comprehensive understanding of nonuse of information. Without such an understanding, information workers may use the words "nonuse of information" while referring to very different phenomena. This lack of understanding makes the job of the information professional difficult. For example, the model presented here reduces hundreds of theories of information behavior to a conceptually manageable taxonomy of six conditions that lead to nonuse of information. The six conditions include: 1) intrinsic somatic conditions, 2) socio-environmental barriers, 3) authoritarian controls, 4) threshold knowledge shortfall, 5) attention shortfall, and 6)

information filtering. This dissertation explains and provides examples of each condition.

The study of a novel area that had no prior theory or model required a novel methodology. Thus, for this study, I adopted the pragmatism formulated by Charles Sanders Peirce, a method of evaluating concepts by their practical consequences. This pragmatism applied in two ways to the study of nonuse of information. First, because nonuse of information is a behavior, pragmatism helped me to limit the psychologic implications of the study to behavior, rather than to expand the discussion to psychodynamics or cognition, for example. I justified this limiting on the basis that behavior reflects the use or nonuse of information, and behavior is more observable than other aspects of psychology, such as cognition. Second, Peirce's concept of pragmatism supported another of his contributions to philosophical inquiry, retroduction, sometimes referred to as abduction. To study nonuse of information through retroduction, I created a five-step "definition heuristic," based on the writings of Spradley and McCurdy. I then created a nine-step "retroduction heuristic" based on the system of logic identified and termed "retroductive" or "abductive" by Peirce. I used this heuristic to identify examples of nonuse of information and applied the examples to a second corpus of research reports that contained examples of compelled nonuse of information. The taxonomy of this study resulted from this second application and represents a descriptive model of compelled nonuse of information.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1: INTRODUCTION

The strongest human instinct is to impart information.
The second strongest is to resist it.
--widely attributed to Scottish author Kenneth Grahame (1859-1932)

The subject of this study

> [T]he aircraft began its takeoff roll, accelerated to a maximum of about 137 knots, ran off the end of the runway through the airport perimeter fence, and impacted trees on an adjacent horse farm. The entire sequence took about 36 seconds. The airplane was destroyed by impact forces and a post-crash fire. (National Transportation Safety Board, 2006)

> [T]he genocide of Jewish people [was not] murder but [w]as "the 'holiest human right and … obligation,' which is 'to see to it that the blood is preserved pure and, by preserving the best humanity, to create the possibility of a nobler development of these beings'." (Adolf Hitler, 1939, p. 606; quoted by Lifton, 1986, p. 431; quoted by Tsang, 2002, p. 39)

> [W]omen may be particularly vulnerable to this learning barrier [anxiety concerning personal mastery] because of a lifetime of subtle and not-so-subtle inferences of personal inadequacy in educational settings. (Dunn, 1987; cited in Dore, 1994, p. 99)

Forty-nine of the 50 people aboard the aircraft died because the pilots and air traffic controller ignored information that the aircraft was on the wrong runway. Some six million Jews died because Nazis created nonuse of information among tens of millions of German people. Hundreds of millions of women in the U.S. do not fulfill their potential because educational systems provide misleading information about their capabilities. These three situations appear to occupy discrete contexts (aviation safety, political science, sociology), yet the three share a thread--the compelled nonuse of information. Perhaps we could

recognize and mitigate similar situations if we could unravel that thread and follow it to understanding.

Teachers, librarians, orators, and members of the helping professions such as counselors and psychologists -- in short, information workers -- daily confront the use and nonuse of information. They train and practice, and they develop concepts about information sufficient to the conduct of their work and lives. These concepts, however, are highly individualistic, requiring each information worker, in effect, to "reinvent the wheel" with respect to developing concepts about the use or nonuse of information. This process of reinvention may be a necessary part of vocational maturation -- but what if it is not? What if we could create consensus about certain basic concepts in the field of information science? For example, could consensus on a concept such as compelled nonuse of information (CNI) facilitate training, maturation, and communication among information workers? This dissertation begins to explore that possibility by reporting the results of a philosophical and empirical study of CNI.

The place of this study in the field of information science

Over the last 40 years, the literature of information science has contained reviews of information use. In the view of many (e.g., R. S. Taylor, 1978, ch. 3), these reviews generally focused on information needs, uses, and users. The *Annual Review of Information Science and Technology* (ARIST) published T. J. Allen's review of information needs (1969, p. 3). While prior reviews had focused

on information systems, Allen's review centered on the user. In 1986, ARIST published a review by Dervin and Nilan (1986) of studies between 1978 and 1986 that followed this emphasis on the user, an emphasis called by some a "user turn." These studies investigated the information needs of the individual user, rather than the design of systems or the needs of classes of users. The ISI Web of Knowledge database of scholarly articles reported that the Dervin and Nilan article was cited 275 times between 1986 and 2008, and a number of information scientists (Durrance, 1989; Chang & Rice, 1993, p. 231; T. D. Wilson, 1997, p. 551; Glammack, 1999, p. 16; Frohmann, 2004, ch. 2) have included the Dervin and Nilan article in lists of influential articles. T. D. Wilson (1981, p. 3); Dervin and Nilan (1986); Westbrook (1993; 1995); T. D. Wilson (1994; 1997); Bates (1999); T. D. Wilson (1999a; 1999b; 2000); Case (2002); and Fisher et al. (2005) comprise a very small sample of this "user" literature.

Over the last 60 years, however, the literature of information science has contained only infrequent reviews of information *nonuse*, whether from a systems or a user viewpoint. Notable reviews of nonuse appear in Zipf (1949), Dervin (1973), Wurman (1989; 2001), T. D. Wilson (1997), and Case (2002). Chapter 2 presents in more detail a review of the literature of information use and nonuse. This study extends the list of reviews of nonuse by evaluating a corpus of approximately 1,400 articles that mention the concept of nonuse of information. This corpus resulted from a search of the texts contained in several academic databases for the keywords listed in Appendix 1. The magnitude of this project

dictated the choice of databases: other than the two exceptions noted in Appendix 1, the chosen databases provided full-text on-line access to articles, with a minimum of database manipulation. Searches of other databases, particularly those searched by common Web search engines such as Google, returned few full-text articles and far too many coincidental and incorrect matches to be of practical value to this study. A pilot project about nonuse of information provided the search terms.

This study presents a taxonomy and description of a subset of conditions leading to of nonuse of information, specifically, conditions leading to *compelled* nonuse of information (CNI). The taxonomy of conditions compelling nonuse of information appears in Figure 1.1, which follows.

Figure 1.1, Part 1: SOMATIC BARRIERS to information use (excess of "push")

1 Intrinsic somatic conditions
- 1.1 Congenital abnormalities and subsequent trauma leading to physical impairments
  - 1.1.1 Toxic influences in pregnancy, such as alcohol
  - 1.1.2 Maternal psychological disturbance, such as stress
  - 1.1.3 Perinatal risk factors, such as low birth weight
  - 1.1.4 Toxic chemicals in the environment, such as lead
  - 1.1.5 Infectious causes, such as Lyme disease
  - 1.1.6 Selective deficiencies, such as iodine deficiency
  - 1.1.7 Head injury
  - 1.1.8 Neglect and malnutrition
- 1.2 Trauma that leads to psychological predispositions
  - 1.2.1 Dissociation
  - 1.2.2 Homeostasis
  - 1.2.3 Neuro-chemical mandates
  - 1.2.4 Advanced age
- 1.3 Intrinsic psychological predispositions
  - 1.3.1 Gardner's theory of multiple intelligences
  - 1.3.2 Miller Behavioral Style Scale
  - 1.3.3 Avoidant coping style
  - 1.3.4 Sex differences
  - (1.3.5 Limits of short-term memory, & eidetic v. symbolic imagery)
- 1.4 Intrinsic somatic conditions of uncertain origin, such as those listed in the *DSM-IV*

2 Socio-environmental barriers
- 2.1 Geographical or temporal isolation
- 2.2 Inadequate or malfunctioning information systems
- 2.3 Lack of capital
  - 2.3.1 Lack of economic capital
  - 2.3.2 Lack of cultural capital
  - 2.3.3 Lack of social capital

3 Authoritarian controls, listed from greatest to least intentionality
- 3.1 Censorship (including restrictive information systems)
- 3.2 Disinformation
- 3.3 Reward and punishment
- 3.4 Explicit approval or disapproval
- 3.5 Tacit approval or disapproval
- 3.6 Misinformation
- 3.7 Bureaucracy
- 3.8 Mistakes

(Figure 1.1 concluded on next page)

Figure 1.1, Part 2: COGNITIVE BARRIERS to information use (lack of "pull")

4 Threshold knowledge shortfall
- 4.1 Illiteracy and other unfamiliar encoding systems
- 4.2 Mutually unintelligible languages
- 4.3 Special vocabularies
- 4.4 Sufficient language
- 4.5 Euphemistic language
- 4.6 Extra-lexical information
- 4.7 Lack of awareness of availability of information

5 Attention shortfall
- 5.1 Engrossment, flow, involvement, presence, rumination
- 5.2 Distraction
- 5.3 Affect: emotion or mood
  - 5.3.1 Threat to life
  - 5.3.2 Threat to health
  - 5.3.3 Threat to self-image or ego
    - 5.3.3.1 Threat to *self*-image, negative face, or positive face
    - 5.3.3.2 Threat to one's image as held by *others*
    - 5.3.3.3 Attribution theory
  - 5.3.4 Fear of the unknown
  - 5.3.5 Factors that mitigate affect
    - 5.3.5.1 Perceived lack of self-efficacy
    - 5.3.5.2 Pre-existing affective state
    - 5.3.5.3 Proximity of the threat
- 5.4 Priming
  - 5.4.1 Lexical priming (and semantic priming)
  - 5.4.2 Priming with respect to the source of the information
  - 5.4.3 Priming via naïve conceptions

6 Information filtering
- 6.1 Least effort
  - 6.1.1 Avoidance of cognitive overload
  - 6.1.2 Resignation
  - 6.1.3 Avoidance of information where cost exceeds benefit (including "optimal foraging" or satisficing)
  - 6.1.4 Avoidance of activity involving "the life of the mind"
- 6.2 Least conflict (seeking "fit," or avoidance of apperception)
  - 6.2.1 Avoidance of irrelevant or "wrong" information
  - 6.2.2 Avoidance of cognitive dissonance
  - 6.2.3 Principle of the best
  - 6.2.4 Deference to cognitive authority (based on content)

Figure 1.1: The taxonomy of conditions leading to CNI

This dissertation defines and describes CNI and specifically does not describe other facets of information studies, such as *volitional* nonuse of information (VNI). Of the approximately 1,400 articles retrieved by the full-text search, 114 pertained to the subject of this study, as explained in Chapter 3. Chapter 3 presents in more detail the methodology used to derive the taxonomy of conditions leading to CNI.

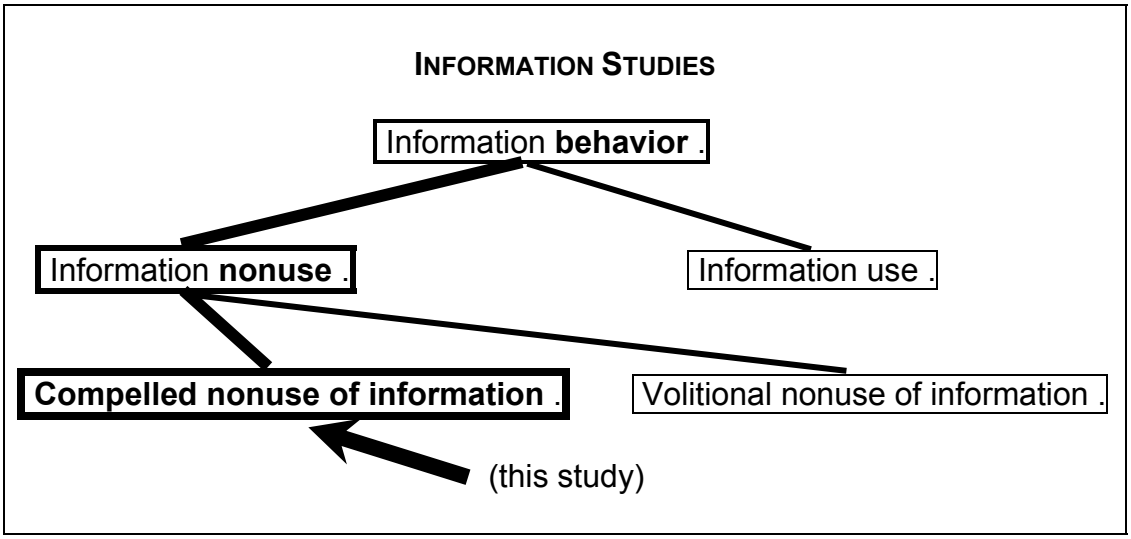

Figure 1.2: The scope of this study within the field of information studies.

The Definition of Compelled Nonuse of Information (CNI)

The definition of CNI used in this study rests on the definitions of three fundamental concepts: a definition of information, a definition of information behavior, and a definition of "compelled." These concepts occur frequently in academic and non-academic speech, and their definitions here apply only to the study reported in this dissertation. A definition of CNI follows the explanation of

the three fundamental definitions, derived from various literatures as explained in Chapter 3.

A definition of information

The definition of CNI rests first on Bateson's definition of "information" as "a difference which makes a difference" (1972, p. 453). Although some scholars may not accept Bateson's assertion, others do, in the fields of education (e.g., Erickson, 2004, p. 492; Mathiasen, 2004, p. 275; Davis & Sumara, 2007, p, 55), information science (e.g., Brier, 2004, pp. 643 & 646; Jacob, 2004, p. 515), psychology (Cowan & Presbury, 2000), and Marxist scholarship applied to education (McClaren, 2006, p. 92). In formulating his definition, Bateson was trying to quantify information (cf. Harmon, 1984, 1986), to develop a calculus of information, using the mathematical concept of "change," frequently expressed as the Greek symbol for *delta*, Δ or ∂. He expressed this concept of information as "a change that makes a change." Bateson later substituted "difference" for "change" to present the definition commonly recognized as his, as diagrammed in Figure 1.3:

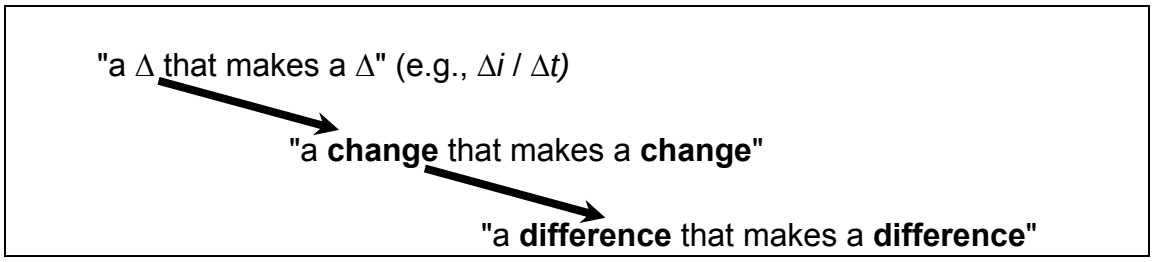

Figure 1.3: The evolution of Bateson's definition of information.

The study reported here continues in two respects Bateson's quest for a calculus of information. First, conditions leading to CNI appear in Figure 1.1 in an ordinal scale, ordered from least to most involvement of conscious cognitive processes. This presentation of an ordinal scale is a step toward the development of interval and ratio scales, which then might facilitate the development of a calculus of information. This is not to say that creating an interval or ratio scale for CNI is possible or desirable. The ordinal scale merely takes information science one step further toward determining whether CNI can be quantified. Second, the elements in the present taxonomy of conditions leading to CNI appear to conform to the fundamental laws of modern physics, specifically, the conservation laws of classical mechanics: conservation of mass, conservation of energy, conservation of momentum, and the like. I summarize these fundamental laws very crudely and anthropomorphically by the expression: "Things do not like to change." The elements in this taxonomy appear to represent, each in its own way, maintenance of *status quo* and a concordance to the classical mechanics of modern physics. Whether the analogy proves to be valid or false, it can be tested, which is one step further than Bateson got. The study reported here explores the universe of information as defined by Bateson and investigates CNI within that universe.

A definition of information behavior

The second fundamental concept important to this study is information behavior, and three definitions of information behavior undergird this study. The

first, a generalization reminiscent of positivistic communications and information theory (e.g., Shannon & Weaver, 1949) defines information behavior as "the totality of human behavior in relation to sources and channels of information, including both active and passive information seeking, and information use" (T. D. Wilson, 2000, p. 49). Wilson's definition parallels closely that of the Library of Congress Subject Heading Scope Note for "Information behavior": "Here are entered works on the ways human beings interact with various sources and channels of information, including both active and passive information-seeking, and information use."

The second definition of information behavior important to this study, a more constructivist definition, defines information behavior as "how people need, seek, give, and use information in different contexts, including the workplace and everyday living" (Pettigrew et al., 2001, p. 44). As used in this study, these definitions do not contradict each other and apply interchangeably.

The third definition of information behavior important to this study, a definition based in my study of behavioral psychology, defines information behavior as a response to a stimulus, where the stimulus is information and the response is a use or nonuse of information. In this study, these definitions do not contradict each other and apply interchangeably.

Based on these three definitions, this study defines information behavior through its characteristics, such as the conditions that lead to it and the nature of its manifestations, and examines information behaviors reported in the literatures

of information science and related fields. These reports frequently result from empirical observations of information behavior, such as observations of library reference queries (R. S. Taylor, 1962) or observations of *lack* of library reference queries, that is, observations of patrons' reluctance to pose reference queries (Durrance, 1989). Thus, for this study, information behaviors consist of those behaviors described by studies, largely empirical, of how people interact (or fail to interact) with information.

A definition of "compelled"

The third and perhaps most important fundamental concept that is necessary to understanding this study is the difference between volitional and compelled behavior. In brief, this study defines compelled behavior as behavior over which the person performing the behavior has *no* control. Volitional behavior, then, is behavior over which the person *has* control. In other words, when a person has no control over the initiation of a response to a stimulus, that response comprises compelled behavior.

A more fundamental explanation of the difference between CNI and VNI requires a classification of types of cognition. Cognition may occur over a continuum of strengths, as in "a dawning awareness" or "a half-remembered dream," but, for the purposes of this study, cognition falls into the dichotomy of traceable or non-traceable cognition. Figure 1.4 below diagrams this dichotomy and presents the relationship of CNI to types of cognition. CNI appears in the top

half and VNI appears in the bottom, and this distinction between intuition and traceable cognition is vital to a diagnosis of CNI or VNI, as explained below.

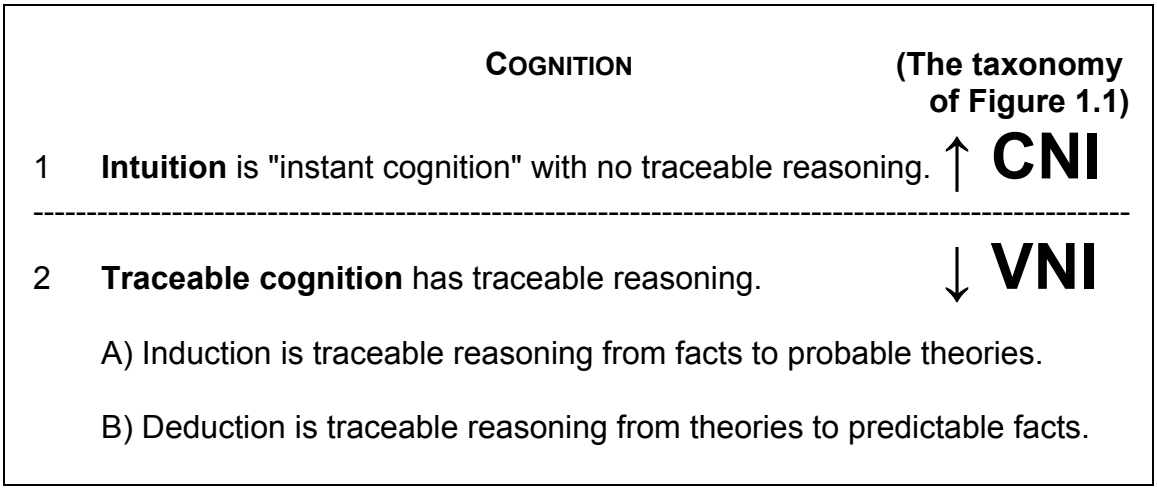

Figure 1.4: The continuum of cognition with respect to nonuse of information. Note that CNI, represented by the taxonomy of Figure 1.1, lies in the top half of this diagram, in the portion labeled "Intuition."

Intuition has the least traceable cognition, followed in order by induction and deduction (*Concise Routledge encyclopedia of philosophy*, 2000, p. 403). The line of reasoning leading to *intuition* remains, by definition, untraceable. However, the traceable *induction* popularized by Sherlock Holmes (mislabeled by Conan Doyle as deduction) leads to a probable end, although it also can lead to other probable ends. The reasoning of correctly labeled *deduction* follows traceable, logical rules and leads to a relatively certain conclusion. Because behavior resulting from traceable cognition is volitional, the CNI that is the subject of this study includes only the *intuitive* elements of nonuse of information, elements that involve no traceable cognition and, therefore, no volition.

An important factor in the diagnosing of CNI appears at this point in this discussion, the traceability by an observer of a person's cognition. If the cognition appears to be illogical or irrational, the person may be experiencing a compulsion such as psychological disorder (e.g., Element 1.4 in Figure 1.1, intrinsic somatic conditions of uncertain origin, such as those listed in the *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition, *DSM-IV*). The judgment of illogical or irrational, however, can result from a CNI on the part of the *observer* (e.g., prejudice), so that such a judgment must be used cautiously. For example, if I have pre-judged all Ruritanians to be sub-human and fit only for slavery, then I will think of Ruritanian emancipators as irrational. Thus, if the person *performing* a behavior can trace the cognition leading to the behavior, the behavior, in general, should be considered volitional, regardless of what the person *observing* the behavior thinks.

A useful separation between VNI and CNI lies at a point where the information user/nonuser becomes aware of the cognition that precedes the nonuse. In other words, when the person becomes *aware* of the cognition that precedes nonuse of information (e.g., "Hmmm, this appears to be a political commercial."), can *trace* the cognitive paths that led to the nonuse (e.g., "I never listen to political commercials."), and *maintains* the nonuse (e.g., "Therefore, I will not listen to this commercial."), the nonuse becomes *volitional*.

This difference between volitional and compelled behavior applies only to the use or nonuse of information and mandates an important modification to Figure 1.2, and the modified version of Figure 1.2 appears in Figure 1.5 below.

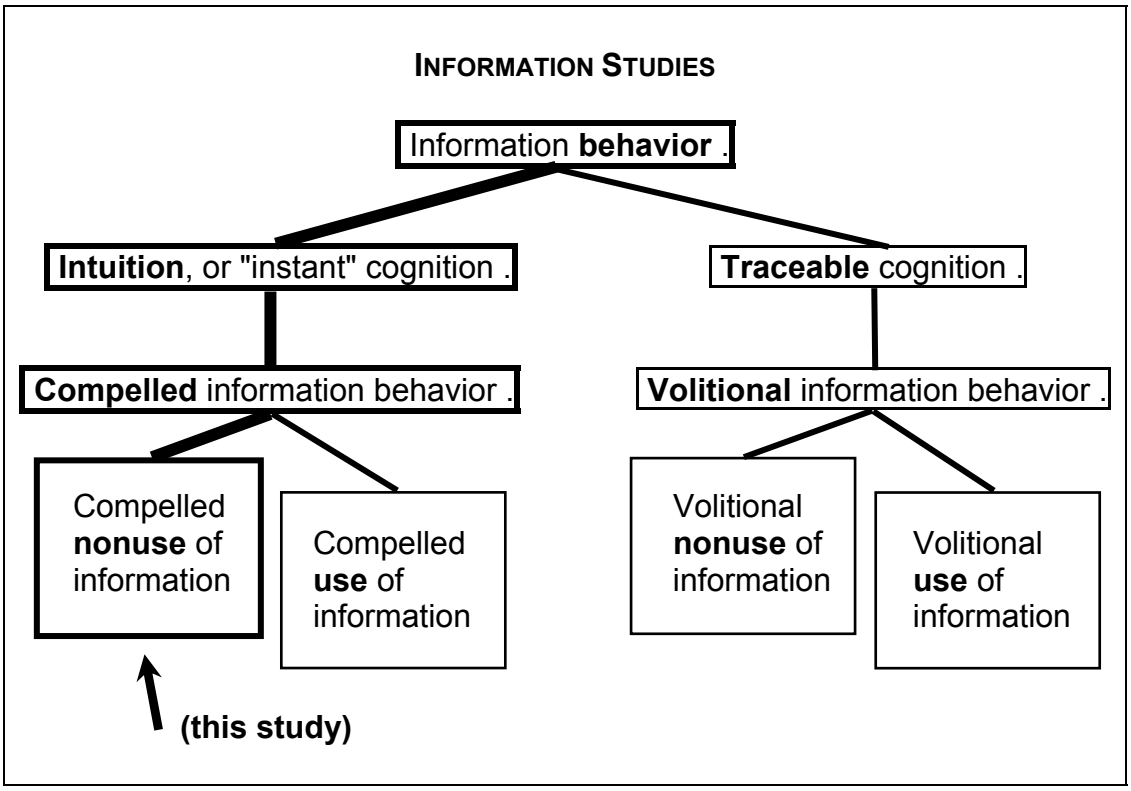

Figure 1.5: The scope of this study within a revised diagram of the field of information studies.

In this revised diagram of information behavior, the widely accepted bifurcation between use and nonuse of information becomes less important than the bifurcation between compelled and volitional behavior. With these definitions of information, information behavior, and "compelled," we now can define CNI.

A definition of CNI

Using the definitions of information, information behavior, volitional behavior, and compelled behavior, this dissertation defines CNI.

CNI describes behaviors beyond the control of a person, behaviors that do not allow a difference to make a difference.

This definition is a dictionary definition, one of five possible types of definitions, as explained in Chapter 3. Although it reifies and personifies CNI in a somewhat simplistic manner, it describes concisely the manifestations of CNI found in the study corpus. The study itself comprises a full definition of CNI. As with Bateson's, Wilson's, and Pettigrew et al.'s definitions of information and information behavior, this dictionary definition of CNI does not require specification of *why* information is not allowed to make a difference, *what* information is not allowed to make a difference, or by or to *whom* the information is not allowed to make a difference. Why, what, by whom, and to whom comprise *contexts* in which CNI operates. Although extremely important, as such, to the study of information, these contexts do not affect the taxonomy of CNI developed by this study, because the taxonomy describes information behavior at a higher level of abstraction, embracing all contexts simultaneously. In other words, context does not differentiate any element of the taxonomy from any other element.

At this point, two further concepts prove useful, the concept of *mitigation* and the concept of *resistance to change*. For the purposes of this taxonomy, CNI can be mitigated by additional information. In this sense, mitigation refers to a modification or reduction of CNI. This concept of additional information does not mean that CNI *will* be mitigated or *should* be mitigated; but that CNI *could* be mitigated with sufficient additional information.

As explained above, the second concept, *resistance to change*, conforms to the conservation laws of classical physics and underlies virtually all examples of CNI. In other words, each example of CNI resembles the convenient fictional concept of a closed system that attempts to maintain an internal status quo. For example, the mechanism of habituation attempts to maintain an internal homeostasis when a person's body experiences trauma. The additional information required to mitigate that CNI is an "unbalanced force" in the sense of Newton's First Law of Motion, in which an object in motion will remain in motion and an object at rest will remain at rest unless acted upon by an unbalanced force. The addition of information also satisfies Newton's Third Law of Motion, "For every action there is an equal and opposite reaction," in that the introduction of an unbalanced force into a closed system produces a proportionate change in the system. Because of its fundamental applicability to all examples of CNI, "resistance to change" appears here as a meta-theory, operating at a higher level of abstraction than CNI, and this study will not discuss it further.

The rationale for a study of CNI

The potential contributions of this dissertation to the study and practice of information science are several. Explanations follow this list:

1. presentation of a methodology for investigating a phenomenon for which prior study has not established a theory, models, or data: The methodology consists of a novel nine-step retroduction heuristic that incorporates a novel five-step definition heuristic;
2. refinement of the vocabulary of information science through a definition of compelled nonuse of information (CNI);
3. inception of the formulation of a theory of CNI;
4. presentation of a conceptual or diagnostic tool for information workers;
5. increased awareness of prejudice against nonuse of information;
6. theoretical advancement in the design of information systems;
7. development of *nonuse* as a Hegelian antithesis to information *use*;
8. development of "markers of anti-intellectualism, and
9. clarification of some of the legal and jurisprudential ramifications of CNI.

The first contribution of this dissertation to the study and practice of information science is a methodology for investigating phenomena for which prior study has not established a theory, models, or data. The methodology follows from the pragmatism formulated by Charles Sanders Peirce, a method of evaluating concepts by what is called his pragmatic maxim:

> Consider what effects, that might *conceivably* have practical bearings, you *conceive* the objects of your *conception* to have. Then, your *conception* of those effects is the whole of your *conception* of the object. (1905, p. 481; reprinted in 1931-1958, v. 5, p. 438)

In other words, Peirce equated objects with their practical consequences. This pragmatism applied to both the central conception of this study (CNI) and to the methodology employed for this study of CNI, as explained more fully in Chapter 3.

The adoption of pragmatism helped me to grasp the concept of CNI through an emphasis on its effect. In this study, the effect of CNI is a behavior, nonuse of information. This focus on behavior helped me to limit the study to the psychologic metatheory of behavior, rather than to expand the discussion to the psychodynamic or cognitive ramifications of nonuse. While psychodynamic and cognitive terms appear in the study, the study focuses on behavior, specifically, the behavior of nonuse of information. I justified this limiting for the practical reason that behavior is more directly observable than psychodynamics or cognitivism, which incorporate the less-observable elements of mental states.

As applied to the methodology of the study, pragmatism underlies Peirce's concept of retroduction / abduction. Pragmatism evaluates a conception by its consequences, as if working backward from a result to its cause. Retroduction does the same, starting with a phenomenon and working backward to a hypothesis. Peirce postulated retroduction as an iterative, somewhat intuitive process consisting of formulating, testing, reformulating, and retesting retroductive suggestions.

For this study, I created two heuristics: a nine-step heuristic for the performance of retroduction, and a five-step heuristic for creating a definition of a

phenomenon where none previously existed. The retroduction heuristic derived from steps described by Peirce (1976b, pp. 319-320) and by his followers such as Rennie (1998, p. 111). The definition heuristic evolved from Spradley and McCurdy's five-fold classification of definitions (1972, pp. 68-70).

The second contribution of this dissertation to the study and practice of information science is a taxonomy and description of CNI as a tool that might facilitate communication between information workers who now use the concept nonuse of information without the additional specification of compelled or volitional. For example, the term "cognitive avoidance" appeared in hundreds of the articles reviewed for this study (e.g., C. Meyer et al., 2005), but fewer than 20 of these articles (e.g., McDermott, 2007) indicated whether the avoidance was volitional or compelled.

The third contribution of this dissertation to the study and practice of information science is that it provides the inception of a theory of CNI. This study has produced a taxonomy of conditions that compel nonuse of information. As a visualization or reflection of CNI, that taxonomy is a descriptive or explanatory *model* of CNI. If empirical studies later substantiate this model, it will constitute a *theory*. To paraphrase Katzer et al. (1998, p. 276), a model gives order, while a theory gives meaning. In other words, this dissertation presents a *model*, an ordering to the phenomenon of CNI. Empirical substantiation of this model subsequently will lead to a *theory* of CNI.

This use of the word "theory" may confuse those who hold a different conception of the word. Dubin, for example, equates *theory*, *theoretical model*, *model*, and *system*. He differentiates, however, the term "empirical system," which he defines as "what we apprehend, through human senses, in the environment of man" (1978, p. 18). This dissertation describes what Dubin would call an empirical system, rather than a theory.

The fourth contribution of this dissertation to the study and practice of information science is a taxonomy of six conditions that compel the nonuse of information. I believe that no information workers (librarian, teacher, orator, health professional) work from a *tabula rasa*. Rather, they draw on exposure to hundreds of theories and models of information behavior (e.g., Case, 2002; Fisher et al., 2005) to identify, diagnose, and mitigate nonuse of information by a client. Instead of seeking a closest fit to one of these hundreds of theories and models, the information worker might apply more easily the taxonomy's six conditions as a short, comprehensive checklist.

The fifth contribution of this dissertation to the study and practice of information science is an increased awareness of prejudice against nonuse of information. Information researchers and workers have tended to view nonuse of information in negatively judgmental terms. For example, most of the articles in the study corpus that referred to nonuse of information described nonuse pejoratively. Similarly, most of the study corpus articles that described use of information described use as desirable. C. Harris postulated six reasons that

information workers viewed nonuse as undesirable, in a discussion of nonuse of information institutions such as libraries:

1. "being informed is a virtue;
2. information will make the individual more effective or efficient in any area of his or her endeavours;
3. the use of recorded information reduces the probability of duplication of effort;
4. libraries and information services represent substantial investments (public or otherwise) that should be exploited;
5. individuals have a right to be informed, and should exercise that right;
6. reading is an improving activity." (1984, p. 69)

Harris then (p. 70) suggested that examination of nonuse might reveal conditions under which attempts to eliminate nonuse would not be the best course of action:

1. reasons might exist for the nonuse;
2. nonuse might not be a problem;
3. nonuse might be an intractable problem.

As another example of the confounding effect of prejudice on identification and mitigation of nonuse of information, most people agree than murder, robbery, arson, rape, torture, and similar acts of violence are undesirable, and, as a result, most legal codes punish such acts. Tsang postulated psychodynamic mechanisms such as "rationalization" (2002, p. 39) and "fragmentation" (p. 43) that allowed tens of millions of people in Nazi Germany repeatedly to condone and even to commit such acts of violence, and she labeled the acts immoral. Devonport and Lane (2006, p. 265) presented nonuse of information via avoidance as adaptive or maladaptive for writers of dissertations, allowing the *writers* to apply the label of "mal-" (from the Latin for "bad"). Martin (2000) discussed the moral ramifications of self-deception. Judgments such as

"immoral" and "maladaptive" add a contextual variable to CNI that does not assist and may even hinder the information worker in diagnosing examples of CNI. Therefore, this dissertation presents to the information worker a taxonomy of conditions that lead to CNI and that avoids such judgments.

The sixth contribution of this dissertation to the study and practice of information science is a theoretical advancement in the design of information systems. For example, Cho and Cheon (2004) studied the affective, cognitive, and behavioral aspects of what they term Web banner blindness, that is, ignoring advertising imbedded in Web sites. Cho and Cheon found that perceived goal impediment, perceived ad clutter, and prior negative experience explained banner blindness. The condition described in Figure 1.1 (above) as information filtering, specifically the condition labeled "perceived cost exceeds perceived benefit," explains the findings of Cho and Cheon more parsimoniously.

The seventh contribution of this dissertation to the study and practice of information science is the development of *nonuse* as a Hegelian antithesis to the thesis of information *use*. Information science has evolved over the years, but always with a focus on information *use*. This dissertation presents a model of *nonuse* as the antithesis of use and possibly as the next phase of the Hegelian dialectic in the development of information science. Karl Popper (e.g., 1962; 1966) bitterly castigated the concept of dialectic because he thought that it "undermined and eventually lowered the traditional standards of intellectual responsibility and honesty" (Popper, 1966, p. 395). I have concluded that the

dialectic is an important mechanism for the advancement of a discipline through a broadening of the scope of discussions in the discipline and through presentation and resolution of conflicting views, and this dissertation accordingly presents an antithesis in the information science dialectic.

The eighth contribution of this dissertation to the study and practice of information science is a deepening of understanding of the development of anti-intellectualism in America. Goldstein (2008a) cites Art Winslow as saying: "What are the markers of anti-intellectualism? Not even Hofstadter worked that answer out fully." Further study and refinement of CNI could lead to a definition of the "markers of anti-intellectualism" and facilitate the formation of public policy about anti-intellectualism.

The ninth contribution of this dissertation to the study and practice of information science is a clarification of some of the legal and jurisprudential aspects of conditions leading to CNI. Glenn (2008) reviewed a number of studies in which priming and prejudice appear to have affected criminals' behavior, casting doubt on the intentionality of their actions. In other words, criminal acts that result from conditions such as the precognitive priming or prejudice that lead to CNI might merit a different legal response than criminal acts that result from cognitive deliberation.

The potential contributions of this study to information science might also benefit other academic disciplines and arenas of human endeavor. Specifically, the methodology for investigating novel phenomena could facilitate the study of

other disciplines in the humanities (e.g., languages and literature) and the social sciences (e.g., anthropology or political science). Conversely, if CNI proves to be rare or negligible in impact, this study will mark the beginning of a dead-end path that other disciplines need not travel.

The structure of this study of CNI

Chapter 1 has presented an introduction to this study. The introduction consisted of a description of the place of the study in the field of information science, a definition of CNI, and the rationale of the study. Chapter 2 explores the literature of information science and related disciplines for previous writings about use of information, nonuse of information, and compelled nonuse of information. Chapter 3 presents the evolution and conduct of this philosophical and empirical inquiry about CNI. This evolution and conduct included formation of the concept of CNI, development of the heuristics and methodology required for its study, the theoretical basis of such an inquiry, the conduct of the inquiry, and limitations of the methodology. Chapter 4 presents the results of the study--the taxonomy and explanation of the six primary conditions leading to CNI. Chapter 4 also discusses additional conditions, conditions that the study was expected to find but did not. Chapter 5 concludes the study with a summary of its findings and recommendations for future research about CNI. Appendices and a list of references follow Chapter 5.

CHAPTER 2: PREVIOUS STUDIES ABOUT INFORMATION USE AND NONUSE

The literature reviewed for this study, primarily the literatures of information science, psychology, sociology, education, and communication studies, includes articles about *use* of information and articles about *nonuse* of information. Because of this study's genesis in information science, this chapter focuses largely on the literature of that discipline, discussing first information *use* and then information *nonuse*.

Previous studies about use of information

Many authors (e.g., Buckland, 1996; Frohmann, 2000) present the documentalists of the late 19th and early 20th centuries as the originators of information science. Speaking broadly, information science research from the time of the documentalists through the first half of the 20th century focused on information systems. In the second half of the 20th century, this "systems" approach expanded to a "user" approach to the study of information. In other words, research began to focus on adapting information systems to users rather than developing systems to which users had to adapt. Information *behavior* comprised a focus of this user-centered approach, and information science borrowed concepts and research methods from the field of psychology (the study of behavior and mental processes).

Following the expansion of psychology from behaviorism to cognition in the 1970s, information science research developed a "cognitive turn" (I.

Cornelius, 2002, p. 406), exploring the cognitive processes underlying users' behavior (e.g., Bandura & Adams, 1977; de May, 1977). In the 1980s, "cognitive" expanded to "socio-cognitive" (e.g., Capurro, 1985; cf. Hjørland, 2002), postulating the importance to information behavior of social or environmental influences. The proliferation of computers in the 1990s propelled information science research about human-computer interaction (e.g., Marchionini, 1991, 1992), and the further expansion of research about *environmental* influences led to theories of *situational* influence (e.g., Cool & Williams, 2001). Information science research continues to expand, and many researchers continue to study the information behavior of users. This study situates itself in those studies of the information behavior of users.

T. D. Wilson (1981) identified studies occurring as early as 1916 that now would be called user studies, however, he named the Royal Society Scientific Information Conference (1948) as the earliest user study containing the specific terminology of "user." *Reviews* of user studies began to appear some 20 years after that Royal Society Information Conference (e.g., T. J. Allen, 1969), and *models* of information use began to appear a few years later (e.g., Dervin, 1973). The following two sections describe first the reviews and then the models.

Reviews of articles about information use

The literature of information science contains a number of reviews of theories of information behavior, with the majority of the behaviors pertaining to information need, use, and users (cf. Appendix 2). The *Annual Review of*

Information Science and Technology (ARIST) published several landmark reviews of user studies, including the Ian Cornelius review mentioned above and three of the reviews mentioned here. T. J. Allen compiled an early review of user studies and limited it to studies that he termed "good" (1969, p. 3), by which he meant that the studies were methodologically rigorous and could be generalized to other situations and locales. Allen explored this body of literature through a framework centered on the user and related his findings to the information needs of scientists and technologists (p. 4). T. D. Wilson (1981, p. 3) used what he called an "ecological model" to explain his concept that *context* motivated information-seeking behavior. He listed motivations such as physiological, affective, and cognitive needs. Wilson augmented that review (1994) to incorporate the information seeking model of D. Ellis (1989), and then added the context of uncertainty (1999b). Dervin and Nilan (1986) analyzed the conceptualizations underlying user studies published between 1978 and 1986 and stressed the importance of user-centered research in designing information systems. Hewins (1990) updated Dervin and Nilan's 1986 review. Westbrook (1993; 1995), in her review of system- and user-centered research, included the very practical consideration of the availability to the user of information systems. T. D. Wilson (1997) broadened the scope of his prior review articles to integrate research about information-seeking behavior conducted in other disciplines, specifically, psychology, consumer behavior, innovation research, health communication studies, organizational decision-making, information systems

design, mass media research, communication studies, and sociology. In the same article, Wilson reviewed causes of information *nonuse*, and I discuss that portion of his review in the next section of this chapter. Bates (1999) also noted the 1950s shift to user studies in her historical review. She dated the start of user studies three years later than I. Cornelius and T. D. Wilson, starting with the articles by Conrad (1951) and Mooers (1960). T. D. Wilson (2000) enlarged the scope of his review articles, a trend that grew to produce the encyclopedic books about information behavior by Case (2002) and Fisher et al. (2005).

Some of these studies mentioned nonuse of information indirectly, for example, as the implied absence of information use or as barriers to information use, and Case devoted a section of his book to aspects of nonuse. No review, however, differentiated between volitional and compelled nonuse of information.

Explanatory models of information use

In addition to the *reviews* of information use mentioned in the previous section, information researchers created explanatory *models* to organize their thoughts about information use. Many of these models consisted of simple continua or dichotomies, while others analyzed multiple influences or behaviors.

Three examples illustrate the search for simple models of information use. Maizell (1960) sought the determinants of creativity among chemists, finding that creative chemists read more technical literature on the job, were more independent of thought, were more inquisitive, and had broader cultural interests than less-creative chemists. Chang and Rice (1993) examined the information

seeking behavior called browsing. They determined that browsing is an iterative behavior dependent on three factors: the motivation of the browser, the sources of information, and the results of previous iterations of browsing. Wu (1993) formulated a model of "elicitation behavior" to study question-asking behavior.

Two examples presented broader models of information use. MacMullin and R. S. Taylor (1984) suggested *stages* of information use: verifying, clarifying, decreasing uncertainty, and educating (p. 93, after Dervin, 1973) and *functions* of information (p. 108): to inform, to activate, to instruct, to provide precision, to generate ideas, to trigger the imagination, and to give pleasure. Pettigrew et al. described the cognitive, social, and multifaceted as three "conceptual frameworks in information behavior" (2001, p. 43). Neither study, MacMullin and Taylor, or Pettigrew et al., discussed nonuse of information explicitly, except as the implied absence of use.

Previous studies about nonuse of information

This same literature of information science contains scant mention of NONUSE, the other side of the "information use" coin, as it were. These scant mentions have not led to a robust understanding of nonuse of information: some of these studies examined closely one situation or topic, and some studied large or complex phenomena. I will discuss each type of study in turn, and then discuss previous studies that apply specifically to CNI.

Narrow but deep studies about nonuse of information

Some studies about nonuse of information employed examples and theories that were limited to a single situation or topic of study. For example, Janis and Feshback (1953) studied the effect of fear on the reception of messages about dental hygiene. Strong fear arousal resulted in message rejection, resembling elements 5.3 (affect) and 6.1.2 (resignation) of the taxonomy of Figure 1.1. Asheim (1953; 1983) discussed the difference that he saw between what he described as "authoritarian" censorship and "democratic" selection in the library or museum setting. He felt that authoritarian censorship prevented the use of information more than selection did, an example of element 3 (authoritarian control) of Figure 1.1. S. M. Miller described the effect of coping style on information behavior (S. M. Miller, 1979b, 1979a; 1987; S. M. Miller et al., 1996), suggesting that "monitors" sought out information, and "blunters" avoided information. These behaviors resemble element 1.3 (psychological predisposition) and element 5.3.4 (fear of the unknown) of Figure 1.1. Swanson (1986; 1987) searched for and found examples of bodies of research that did not demonstrate awareness of each other but together could have generated new knowledge. He called this unrealized new knowledge "undiscovered public knowledge," and his undiscovered public knowledge could resemble element 2.1 (geographical barrier), element 4 (threshold knowledge shortfall), or element 5.4 (priming) in Figure 1.1. Zipf's principle of least effort (1949) postulated that fruitful behaviors are performed more frequently than non-fruitful behaviors. Zipf

reasoned that the very frequency of performance then led the performer to choose the fruitful behavior, as if by habit, without reflection on the efficiency or effectiveness of the behavior. Zipf's principle of least effort resembles element 6.1 (least effort) of Figure 1.1.

These examples of narrow but deep studies about information behavior describe particular information behaviors, but they do not draw from, and are not applied to, studies about other information behaviors. For example, citations to Janis and Feshback (1953) appear primarily in the literature describing the advertising technique known as "fear appeal." Asheim (1953; 1983) appears in the literature discussing censorship. Medical literature comprises the primary venue for the studies citing S. M. Miller (S. M. Miller, 1979b, 1979a; 1987; S. M. Miller et al., 1996). Citations to Swanson's undiscovered public knowledge (1986; 1987) appear primarily in literature seeking ways of discovering undiscovered public knowledge. Are these deep but narrow studies an example of avoidance of information perceived to be irrelevant (element 6.2 of Figure 1.1), commonly expressed as disciplinary tunnel vision? Possibly so, but a discipline must specialize in order to increase the depth of its body of knowledge (Bar-Hillel, 1963). Tunnel vision describes the restricted disciplinary discourse that is necessary to all researchers who wish to avoid information overload (element 6.1 of Figure 1.1), but tunnel vision describes that restricted discourse in an unnecessarily pejorative manner. The pejorative nature of the phrase "tunnel vision" illustrates the importance of not applying disapproving judgments to

nonuse of information, because in the case of restricted disciplinary discourse, tunnel vision is vital to the development of the discipline.

Broad studies about nonuse of information

At the other (broader) extreme of applicability lie the studies that apply to more than one manifestation of nonuse of information. Five examples illustrate that broader extreme.

Dervin studied "Information Needs of Urban Residents," as she titled her article (Dervin, 1973), and postulated five *barriers* to information seeking:

1. Societal barriers,
2. Institutional barriers,
3. Physical barriers,
4. Psychological barriers, and
5. Intellectual barriers.

Dervin's list of barriers, while large, did not address other conditions leading to nonuse of information, such as engrossment, distraction, priming, and information filtering by least effort. Chapter 4 discusses these conditions.

Wurman's broad study (1989; 2001) described the phenomenon of resignation as it applied to nonuse of information. He described resignation as a condition "produced by the ever widening gap between what we understand and what we think we should understand" (1989, p. 34). Resignation contributes to several conditions leading to nonuse of information and described in Chapter 4, such as somatic barriers (elements 1, 2, and 3 of Figure 1.1), affect (element 5.3 of Figure 1.1), and information filtering by least conflict (element 6.2 of Figure 1.1). Resignation could result also from conscious cognitive processes, in which

case it would be *volitional* nonuse of information, rather than *compelled* nonuse of information.

T. D. Wilson's broad study presented a list of barriers as found in the literatures of "personality in psychology; the study of consumer behaviour; innovation research; health communication studies; organizational decision-making; and information requirements in information systems design" (1997, p. 551), listed in Figure 2.1:

1) Personal characteristics:
    i) Emotional characteristics (nervousness (affect)
    ii) Cognitive (lack of knowledge; verbal limitations)
    iii) Cognitive dissonance
    iv) Selective exposure / cognitive avoidance
    v) Educational level and knowledge base
    vi) Demographic variables: [advanced] age, sex, etc.
    vii) Physiological (hearing)
2) Social / Interpersonal barriers:
3) Environmental / Situational barriers:
    i) Economic variables (economic costs and time)
    ii) Time
    iii) Geography (and [advanced] age)
    iv) National cultures
    v) Information source characteristics:
        (a) Access
        (b) Credibility
        (c) Channel of communication.

Figure 2.1: Wilson's barriers to information seeking (1997).

Wilson's barriers to information seeking did not address other barriers such as authoritarian controls, engrossment, distraction, priming, and information filtering through least effort, barriers discussed in Chapter 4.

Case (2002) included both narrow and broad studies in his survey of research about information seeking, needs, and behavior. His chapters 5.4 (Avoiding Information) and 5.5 (Information versus Entertainment) provide in 16 pages a comprehensive and concise introduction to nonuse of information. Case's examples of *compelled* nonuse of information appear in Figure 2.2, listed in the order in which they appear starting on page 92 of Case's book, and quoting Case's text. Case's interspersed examples of *volitional* nonuse of information do not appear here, because the pilot study for this dissertation had already narrowed the focus of this study to *compelled* nonuse of information.

1) selective exposure and information avoidance
2) chronically ignorant
3) affective and emotional states and reactions
4) there is just too much material
5) the literature … is redundant and of low quality
6) lack of time
7) literacy
8) access [to computers]
9) socioeconomic status
    i) attitudes, beliefs, values
    ii) [lack of] knowledge
    iii) family socialization
    iv) community identity and connectedness
    v) socioeconomic status
    vi) ethnic or racial group stratification
    vii) behaviors
    viii) media use, and [lack of] media exposure
10) information poverty (ignorance)
    i) low level of processing skills
    ii) social isolation in a subculture
    iii) feel fatalistic and helpless
11) information overload and anxiety
    i) excessive communication inputs / filtering
    ii) too threatening to accept / reduce anxiety
    iii) encounters with new situations
    iv) negative feelings
    v) giving up
    vi) television … may overload the viewer … intentionally
12) information versus entertainment
    i) sense of their constant unhappiness
    ii) programming that is potentially diverting
    iii) novelty sought, but found threatening
    iv) law of least effort.

Figure 2.2: Case's barriers to information seeking (2002).

Case's examples correspond to all six of the primary elements of compelled nonuse of information discussed in Chapter 4.

Fisher et al. (2005) covered much of the same material as did Case. Appendices 2 and 3 list the information behaviors in Fisher et al. that apply specifically to CNI. None of these studies, Dervin, Wurman, Wilson, Case, or Fisher et al., limited their discussion to the information behaviors referred to in this study as *compelled* nonuse of information.

Previous studies about CNI

The informal pilot study conducted for this dissertation identified approximately 400 articles that mentioned nonuse of information. The preliminary taxonomy that emerged from the pilot study already had demonstrated a need to focus on compelled nonuse of information (CNI), and this section reports the results of that narrowed focus. Among the approximately 400 articles identified in the pilot study, three types of literature that pertained to CNI appeared: *collections* of scholarship about CNI (e.g., literature reviews); accounts of isolated *examples* of CNI; and *calls for studies* about CNI. The collections of scholarship and accounts of isolated examples each discussed only a fraction of the examples of CNI produced by the informal pilot study. In other words, each of the approximately 400 articles in the pilot study focused on one or two or a few of the six elements listed in Figure 1.1 and ignored other elements. This dissertation discusses in Chapter 4 all six conditions leading to CNI that the study reported here has identified, and this study's completeness will permit information researchers to identify possible lacunae in this study's model. This study also gives information professionals a heuristic for responding to situations involving

CNI. The following sections of this chapter demonstrate that no prior study of CNI considered all six conditions leading to CNI. Further, the following sections of this chapter identify articles that called for research about nonuse of information. The existence of these calls for research and the apparent absence of a prior study that includes all six elements of the taxonomy indicate the need for this study about CNI.

Collections of scholarship about CNI, such as reviews

The literature of nonuse, as I have concluded that it pertains to CNI, contains no literature reviews that discuss all of the six conditions leading to CNI identified in this study and listed in Figure 1.1. This same literature contains reviews limited to specific topics, in other words, reviews that are narrow in scope but thorough in treatment. For example, Case et al. (2005, pp. 356-358) reviewed two research models of nonuse of medical information: Johnson (1997, pp. 70-100), and T. D. Wilson (1999b). Both models mentioned concepts resembling self-efficacy, which is the perception by a person of the person's ability to act effectively, or to have an effect on a situation, when provided with information about the situation. Johnson identified what he termed "personal relevance factors," in which fear and denial activated nonuse of information and invoked beliefs about self-efficacy. Wilson found that anxiety influenced non-seeking of information and evoked beliefs about salience (Case et al., 2005, p. 357). Case et al.'s review did not discuss many conditions that led to CNI, omitting

discussion of conditions such as intrinsic somatic conditions, socio-environmental barriers, and authoritarian controls.

Previously, Case (2002) had reviewed the literature about "research on information seeking, needs, and behavior," as he subtitled his book. He organized his review through extensive annotated lists of concepts such as users' needs, ignorance, defensive mechanisms, motivation, poverty, and overload. The examples of nonuse of information that Case presented appeared in the previous section of this dissertation, and Chapter 4 describes them in detail. Although comprehensive, Case's review did not present the examples in a relational framework.

The Nuclear Energy Agency (NEA, 1998, p. 46) reviewed and synopsized the literature of nonuse of information related to safety in nuclear power plants and classified it as in Figure 2.3:

1) Lack of usable information
2) Nonuse of available information
    i) Overlooking
    ii) Forgetting
    iii) Ignoring (violation)
    iv) Information reduction (stereotype response without verifying check)
    v) Deficiencies in information processing due to time restrictions or mental capacities
3) Incorrect use of available information
    i) Incorrect use in orientation
    ii) Incomplete use in goal formation
    iii) Formation of an incorrect plan to act
    iv) Mismatching recall of a correct plan to act.

Figure 2.3: The NEA classification of nonuse of information (1998, p. 46).

These barriers to information use did not address in a recognizable way the barriers of authoritarian control, threshold knowledge shortfall, or attention shortfall. The NEA report did not specify whether these examples included volitional or compelled nonuse of information, that is, whether the nonuse resulted from pre-cognitive or cognitive processes.

Watson (1998) reviewed studies about nonuse of information among social workers. He established that, as early as 1927, social workers needed current information in their field, could find that information in the literature of social work, and did not read that literature. He presented annotated lists, grouped according to the study in which they appeared, of reasons that social workers did not use the literature of social work:

1) lack of motivation for searching for information,
2) shortage of time for reading, and
3) an overwhelming preference for informal communication.

These reasons did not include other reasons such as intrinsic somatic conditions, authoritarian controls, or attention shortfall, reasons that Chapter 4 presents.

T. D. Wilson published a description of "intervening variables in information-seeking behaviour" (1997, pp. 556-557). In his review, he identified these intervening variables as personal, social/interpersonal, and environmental. In his article, Wilson also reviewed the literature about "a very general theory from psychology … that of *stress* and *coping*" (1997, p. 554). His article did not address the barriers of authoritarian controls, engrossment, distraction, priming, and information filtering through least effort, barriers discussed in Chapter 4.

Chatman postulated many theories to explain the information behavior performed by the societally disadvantaged. I examined Chatman's theories and compared them to the examples of CNI, and this comparison of Chatman's theories and the examples of CNI appear in Table 2.1:

Study population and situation	Publication
Diffusion theory: opinion leaders did not share job information or skills among CETA women	(Chatman, 1983, 1987b; Chatman & Pendleton, 1998)
Nonuse of print media among janitors	(Chatman, 1987a)
Alienation theory among janitors	(Chatman, 1990; Chatman & Pendleton, 1998)
powerlessness	"
meaninglessness - no future in jobs	"
isolation - physically, & lack of trust	"
self-estrangement (work has no meaning)	"
normlessness [not found in study]	"
Gratification theory: among janitors, life-events are meaningless due to one's social milieu	(Chatman, 1991b; Chatman & Pendleton, 1998)
Information from the outside world is irrelevant	"
low expectation of improvement	"
information from outside is not trusted	"
time = immediate past & present	"
mass media = escape	"
Elderly women did not use the library	(Chatman, 1991a)
Knowledge gap theory & the information poor	(Chatman & Pendleton, 1995)
mass media serve only the "media rich"	"
lack of helpful interpersonal channels	"
Impoverished Life-World of Outsiders & self-imposed information poverty, among CETA women, janitors, & elderly women	(Chatman, 1996)
self-reliance from isolation	"
avoiding risk	"
secrecy & deception	"
Life in the round & self-imposed information poverty: woman inmates avoid non-critical outside information	(Chatman, 1999)

Table 2.1: Chronological list of examples of nonuse of information apparent in the works of Elfreda A. Chatman.

Chatman's examples correspond to all six of the primary elements of CNI as presented in Figure 1.1 and discussed in Chapter 4.

Russ (1983) described the many methods by which society compels itself or individuals within itself not to use the information in works authored by women. These methods appear in Figure 2.4.

1) Less pay
   i) longer working hours and less "leisure" time
   ii) less economic, cultural, and social capital
2) Discouragement or denial of education for women (cf. Lips & Colwill, 1988; Dore, 1994)
   i) less economic, cultural, and social capital
   ii) less education
3) Denial of respect via censorship, misinformation, or disinformation
   i) presumption of triviality of women's writing
   ii) denial that a woman wrote the material in question
   iii) accusations that the woman author was more (or less) than a woman
4) "the double standard of content" (Russ, 1983, p. 46), tending to maintain a status quo.

Figure 2.4: Russ's methods by which society compels itself or individuals within itself not to use the information in works authored by women.

The methods postulated by Russ did not appear to include intrinsic somatic conditions or attention shortfall, which appear in Chapter 4 of this dissertation.

These reviews (Chatman, 1983; Russ, 1983; Chatman, 1987a, 1987b, 1990, 1991b, 1991a; Chatman & Pendleton, 1995; Chatman, 1996; T. D. Wilson, 1997; Chatman & Pendleton, 1998; Nuclear Energy Agency, 1998; Watson, 1998; Chatman, 1999; Case et al., 2005) each described several of the elements of CNI. None of the reviews presented a relational framework for all of the elements.

Isolated examples of CNI

In addition to the aggregations and reviews of CNI that appeared in the preceding sections, the various literatures contained many examples of isolated information behaviors that I evaluated to be CNI. These isolated information behaviors seldom used the term "nonuse of information" or "information nonuse." Instead, other terms appeared. Two examples follow: undiscovered public knowledge and dropout.

Swanson discovered a manifestation of nonuse of information that he called undiscovered public knowledge, that is, "two different sets of problem-oriented specialized articles, or *literatures*," that do not cite each other and yet are complementary "in that together they suggest new information not apparent in either of the sets considered separately" (2001, p. 13). Swanson's derivative "new information" might result from conjoining the knowledge produced by the groups, and the absence of this new information compels others not to use that new information. Swanson did not explain why undiscovered public knowledge remained undiscovered, but this study of CNI presents possible reasons. Specifically, socio-environmental barriers might apply if barriers such as geographical distance prevent the groups of authors from interacting with each other, for example, because they attend professional meetings on different continents. A temporal environmental barrier, that is, a barrier based on a separation in time of one group from another, would appear if one group wrote in the 1930s and another wrote in the 1990s without conducting extensive reviews

of the literature. Threshold knowledge shortfall might explain an unawareness of one group by another if the groups wrote in different languages. Priming might result if one group associated the *words* used to describe the work of a second group with topics unrelated to the first group's topic of research. For example, the *Twilight Zone* episode "To Serve Man," from the Damon Knight (1950) short story of the same name, featured a fictional book, *How to Serve Man*, written by a helpful and apparently benevolent alien species. Earth authorities, misunderstanding the words of the title, regarded the alien species as beneficent and ignored the book as a potential threat, until a better translation of the words of the title revealed it to be a cookbook.

In the field of information science, an April 17, 2005, search of the database *Academic Search Premier* by EBSCO Publishing produced 158 articles containing permutations of the term "sensemaking" in conjunction with the work of Brenda Dervin or Karl E. Weick. Of these 158 articles, 111 articles (dating from 1983 to 2004) mentioned Weick but not Dervin (at least, not Dervin's work on sense making), and 47 articles (dating from 1993 to 2004) mentioned Dervin but not Weick. The same search the next day on *Expanded Academic ASAP* produced 477 citations to Weick, 68 to Dervin, and seven mentioning both Weick and Dervin, with only one (Glammack, 1999) of these seven referring to the sensemaking studies of both Dervin (Dervin & Nilan, 1986) and Weick (1995). Figure 2.5 portrays these results as Venn diagrams.

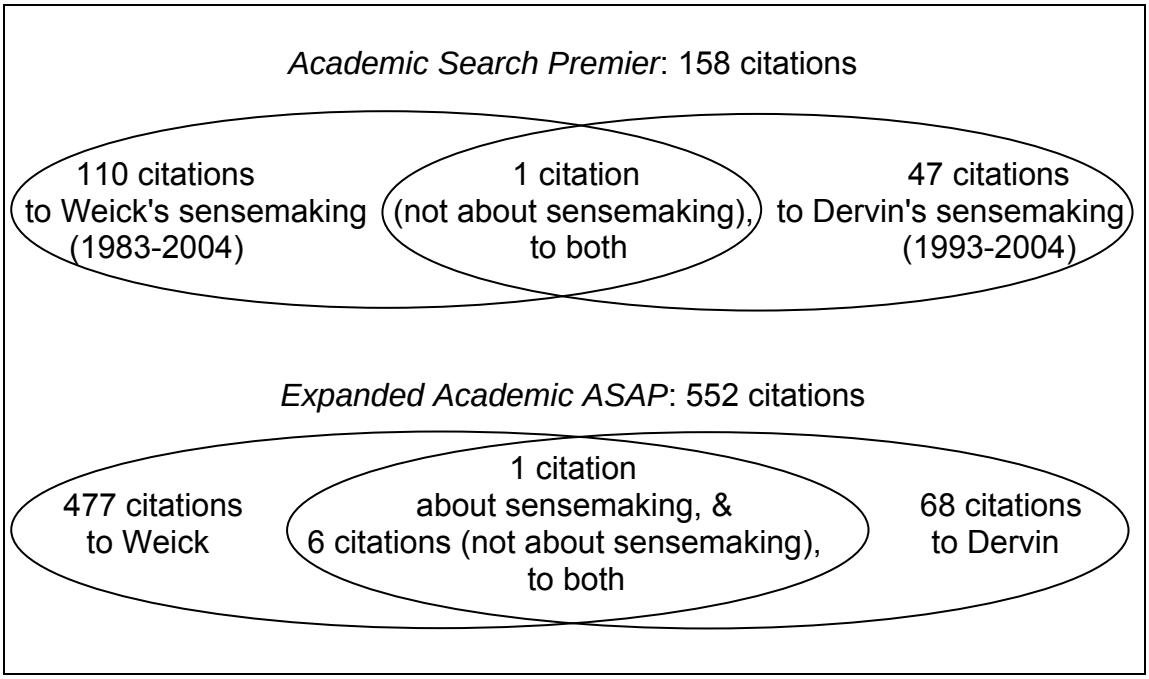

Figure 2.5: Citations to Karl Weick and Brenda Dervin.

Dervin focused on the application of sensemaking to the individual, and Weick focused on the organizational and social uses of sensemaking (Rice-Lively, 1996, pp. 11, 54), but commonalities in the two approaches exist, for example, the constructivist view inherent in any treatment of sensemaking. The existence of the segregation between the literature citing Dervin and the literature citing Weick, with only one article of 552 citing both researchers' sensemaking studies, represents nonuse of "Weick" information by Dervin citers and nonuse of "Dervin" information by Weick citers. Were there no commonalities between the two authors, this segregation would be understandable. Commonalities do exist, however, have existed since 1995, and have been demonstrated at least since

Glammack's article (1999). We probably will never know what knowledge would have resulted had the two camps not ignored each other.

Other examples of undiscovered public knowledge appear. Swanson himself apparently did not discover the parallel public literature of Farradane et al. (Farradane et al., 1973; Farradane, 1980), discussing a phenomenon very much like undiscovered public knowledge (Kwasnik, 1992). Dryden observed non-citation of other schools among schools of eclectic psychotherapy:

> There is little evidence at present that the contributors to this part of the volume ... are drawing upon one another's work to a significant degree. ... It is important that the pioneers of eclectic psychotherapy *demonstrate* an eclectic attitude (i.e., willingness to draw upon diverse sources) among their own ranks. Otherwise they will act as poor role models and increase the chances that schools of eclectic therapy will proliferate in the future. (1986, p. 374)

The literature about nonusers of medical information (elements 1.3, psychological predisposition, and 5.3.4, fear of the unknown, in Figure 1.1) occurs in at least three separate corpora: works following Miller (1987), those following Pifalo et al. (1997), and those following Leydon et al. (2000). Beghtol (1995) found the example of both Ranganathan and Guttman exploring "facet theory" but unaware of each other's work. Beghtol's work, ironically, was paralleled by that of Star (1998).

The second example of phenomena that resemble CNI comes from the literature of education. Of the 21,815 students in grades 9-12 of the Austin Independent School District (AISD) for the school year 1999-2000, 721 dropped out of school (Texas Education Agency [TEA], 2000). Articles about dropout

approach the phenomenon from one or a few standpoints. CNI provides a new perspective on the topic of dropout, perhaps allowing administrators, teachers, and parents to evaluate the effectiveness, cost, and desirability of various interventions. For example, dropout could be an example of resignation (element 6.1.2 of Figure 1.1), resulting from a desire to withdraw from an unpleasant social situation or from education in general. Dropout might result from personality disorders (element 1 of Figure 1.1). Dropout might result from a lack of economic capital (element 2.3.1 of Figure 1.1), forcing the student to work (leaving no time for study), or lack of social capital (element 2.3.3 of Figure 1.1), resulting in a hostile school environment. For the purpose of this study, the important point here is not the reason for dropout, but rather the need to consider all possible reasons. One way to consider all possible reasons is to guide the inquiry with a short, comprehensive checklist of reasons, and the taxonomy of CNI provides such a checklist.

Calls for studies about nonuse of information

Authors in several fields have noted a need for studies about nonuse of information. For example, Villars (1999, p. 1) found that "A national study is required on the phenomenon of the non-use of information and of special studies on agriculture related to policy issues." Pettigrew et al. stated that "Only through focused study can rich insights be obtained regarding such novel concepts as … the non-use of information" (2001, p. 68). Case et al. called for a more specific study of nonuse of information by communication and information science

researchers to explore "avoidance of information from genetic testing for cancer" (Case et al., 2005, p. 360). These calls for study of nonuse of information indicate an absence of satisfactory analyses of nonuse of information.

Summary of Chapter 2

These collections of scholarship about nonuse of information, such as literature reviews; accounts of isolated examples of nonuse; and calls for studies about nonuse, demonstrate the state to which the study of nonuse of information has advanced. I foresee that the next development in the study of nonuse of information must come from a methodical survey and organized presentation of nonuse of information. This study reported in this dissertation represents a portion of such a methodical survey, dealing with explicit examples of *compelled* nonuse of information. The methodology used in this study appears in the following chapter.

CHAPTER 3: METHODOLOGY FOR A STUDY OF CNI

Yesterday, upon the stair
I saw a man who wasn't there
He wasn't there again today
I wish, I wish, he'd go away.
"Antigonish," by William Hughes Mearns, 1899

For several reasons, the study reported in this dissertation was a complex study. As noted in Chapter 2, the literatures of information science, psychology, sociology, and education do not contain articles about compelled nonuse of information. Thus, every stage of this study ventured into unplumbed depths. Beyond that reason, CNI itself represents an absence, rather than a presence, and studying something that, essentially, is not there, presents conceptual problems, as implied in Mearns's poem "Antigonish." Yet, Charles Sanders Peirce verbalized a method of philosophical inquiry to study the unknown, a method called retroduction. Unfortunately, neither Peirce nor his disciples explained the procedure of retroduction. Thus, the need to formulate a retroductive procedure compounded the complexity of this study. None of these reasons, however, was sufficient to forestall philosophical inquiry, and this dissertation reports the results of that inquiry.

This chapter presents the procedure developed for studying the unknown, a methodology applicable to any topic for which no prior study has established a theory, model, or data. The procedure involved iteration, that is, a successive examination and reexamination of the topic, with every iteration narrowing the

scope of the topic while expanding the data examined for the study (see Figure 3.1 below). In brief, this study began with a discussion similar to the phenomenon called brainstorming. That discussion led to a pilot study, analysis of the results of that pilot study, development of a heuristic for defining the topic of the research, and development of a second heuristic for investigating the topic. The heuristics then enabled a full, formal study, producing and explaining a taxonomy of CNI.

Preliminary work:	brainstorming
	pilot study of nonuse of information
	analysis of pilot study data
	formulation of preliminary taxonomy
	survey of contextual information behaviors
	narrowing of the study from nonuse to CNI
	development of an appropriate methodology
Formal study:	search for examples of nonuse of information
	analysis of search results
	formulation of two taxonomies
	selection of best taxonomy
Re-study:	re-coding of the corpus via the taxonomy
	analysis and adjustment of the final taxonomy
	description of each element of the taxonomy

Figure 3.1: The plan of the study.

Brainstorming

Paraphrasing Charles Sanders Peirce, all the ideas of science begin with a surprise (Peirce, 1931-1958, pp. 144-145, from Peirce's "Harvard Lectures on

Pragmatism"). In other words, a phenomenon surprises an investigator, and the investigator then seeks an explanation for the phenomenon. The surprise that inspired the study reported here occurred in the following manner.

At the annual review conducted by my doctoral advising committee in February, 2004, Dr. David Gracy asked me to identify a topic of particular interest. I named the anti-intellectualism described by Hofstadter (1963) and the more general topic of nonuse of information. The thought surprised me, because I had not verbalized it previously. The other members of the committee, Dr. Philip Doty and Dr. Glynn Harmon, encouraged the pursuit of the topic as a dissertation study. They suggested additional aspects, such as information avoidance, ignorance, intentional irrationality, eidetic imagery versus symbolic imagery, and mismatches between information and the multiple intelligences proposed by Gardner (1983). The committee recommended that I conduct a pilot study to explore the feasibility of the topic as subject for a dissertation, and members of the committee suggested search terms that would facilitate the pilot study.

Undoubtedly, all such studies begin with a surprise followed by an episode of intense mental activity, a "brainstorm." The surprise may come from individual inquiry, or it may come from another person. The intense mental activity may occur individually, or it may involve several people. The study reported here began as a group effort.

An informal pilot study of nonuse of information

The pilot study involved a search of the literature of information science and related disciplines for articles containing examples of nonuse of information. The examples displayed properties, one of which was the degree of control over the nonuse by the person not using the information. Ordering the list by increasing degree of control revealed a dichotomy, rather than a continuum. In other words, one example did not display slightly more control than another, but displayed either control (volitional nonuse) or no control (compelled nonuse). This realization led to narrowing the subject of this study from nonuse of information to *compelled* nonuse of information (CNI). To define the concept of CNI, I developed a heuristic for defining novel, previously undefined phenomena. The pilot study also involved a survey of theories and examples of information behavior and the development of a second heuristic for the application of a method of philosophical inquiry for investigating CNI, a method called retroduction or abduction. Employment of the heuristic for retroduction then led to the full, formal study that began with a comprehensive search of several electronic and print databases for examples of CNI, analysis and grouping of those examples, and further refinement of the classification scheme. The examples of CNI led to the taxonomy illustrated in Figure 1.1 and explained in Chapter 4.

The search for examples of nonuse of information

To determine the feasibility of a study of nonuse of information, I conducted an informal pilot study using several large databases of academic and popular literature. Search terms included those listed in Figure 3.2:

(information OR knowledge)
AND
(nonuse OR non-use OR rejection OR avoidance)

OR

(nonuse OR non-use OR rejection OR avoidance)
AND
[(of information) OR (of knowledge)]

Figure 3.2: The pilot study search for examples of nonuse of information via keyword searches.

I also examined the Library of Congress Subject Headings (LCSH) for terms that might make the database search more comprehensive. LCSH had 26 headings that included the term "information," with 11 of these headings pertaining to nonuse of information and 15 pertaining to use of information (see Appendix 4). *None* of the search terms used in the informal pilot study appeared in the LCSH, indicating a possible gap in the LCSH classification of literature about nonuse of information.

I chose the specific databases I used because of their large number of scholarly articles, a number that represented comprehensive coverage of many publishing outlets over a span of many years. I also chose databases because of

their ease of access and searching and their inclusion of the literatures of library and information science, communication, education, psychology, and sociology. I chose these disciplines because, in my experience, their literatures contain a higher proportion of scholarship about nonuse of information than the literatures of other disciplines. I conducted two searches. The databases used in the first search included:

- Academic Search Premier (1965 to date),
- Web of Science (ISI Web of Knowledge, 1975 to date),
- Library and Information Science Abstracts (LISA, 1969 to date),
- Dissertation Abstracts International (1861 to date),
- Library Chronicle Index (1970-1989),
- the Google search engine to search the Web, and
- the printed annual indexes found in volumes 1 through 40 (1966-2006) of the *Annual Review of Information Science and Technology* (*ARIST*).

The first search identified approximately 400 works containing the search terms and describing an example of nonuse of information. For comparison, a search for "information use" or "use of information" identified approximately 43,000 works. A second search, this one of the database *Expanded Academic ASAP*, restricted search terms to the database fields "title," "citation," and "abstract." Both studies yielded a ratio of studies about *nonuse* to studies about *use* of approximately 1% (see Table 3.1).

I have not found literature discussing the size of the disparity between the number of articles mentioning use and the number of articles mentioning nonuse. This apparent lack of discussion has many reasons, two of which I will mention here: a prejudice against nonuse of information, and concepts such as System Justification Theory.

Prejudice against nonuse of information

As discussed in Chapters 1, 3, and 5, writers in the literature of information science (e.g., C. Harris, 1984), education (e.g., Alexander et al., 1997), and law (e.g., Baarsma, 2002) have tended to portray nonuse of information in a negative light. This portrayal, perhaps coupled with a perceived threat to a self-image of "siding with the angels" (element 5.3.3 of Figure 1.1), may have compelled many writers to study information behavior as use, rather than as nonuse.

System Justification Theory

System Justification Theory (SJT) (Jost & Hunyady, 2005, p. 260) states that system-justifying ideologies defend and justify the status quo, resulting in reduced negative affect and less support for social change and redistribution of resources. When applied to the dearth of articles about nonuse of information, SJT would manifest itself as: "If I write articles like articles that already have been published, in other words, if I do not 'challenge the system', then I will be published."

Regardless of the reason for the preponderance of articles about information *use*, the development of theory and practice about CNI will increase the number of articles about nonuse of information.

Search	Use	Non-use	% non-use to use
the first search (7 databases): permutations of information knowledge message } & { rejection avoidance refusal nonuse	43,000	400	0.93%
Expanded Academic ASAP information use OR use of information information nonuse OR nonuse of information AND information rejection OR rejection of information AND information avoidance OR avoidance of information	4,273	42	0.98%

Table 3.1: Percentage of articles discussing *nonuse* of information compared to articles discussing *use* of information.

I examined the articles about nonuse of information and employed a rudimentary form of content analysis to determine the characteristics of nonuse of information present in each article. In this content analysis, I did not attempt to re-code this corpus or to measure the reliability of my coding (intra-coder reliability) because the purpose of this pilot study was to develop concepts rather than data. Initially, I limited the coding procedure to the themes of nonuse of information developed in that brainstorming discussion with my doctoral advising committee. I remained open to new themes, however, and I conceptualized and

named new themes when the occurrences of nonuse in the corpus did not appear to match previously established themes.

Development of the concept of CNI and formulation of a taxonomy

From the coding and adding activity, I developed a list of several dozen themes of nonuse of information. I organized the list of those themes along several continua, and finally created a taxonomy that systematically organized the themes. In other words, the taxonomy incorporated all of the themes of nonuse of information that I had discovered, and the taxonomy presented the themes in a manner in which each theme appeared to be contiguous to its neighbors by virtue of examples that included the two contiguous themes. I ordered the themes along various continua to see if a pattern would occur. Trial continua included:

- "intensity" (the amount of additional information required to overcome the nonuse),
- "obversibility" (the likelihood of an opposing theme appearing),
- "repeatability" (how many times a theme could affect the same person in the same situation),
- "effect on soma" (how strongly the theme affected the body, rather than mental processes),
- "class" (how the theme might affect people of different socio-economic status),
- "thought" (degree of cognition required),
- "timing" (the point in the cognitive process at which the theme would occur),
- "source" (degree of originating internally or externally to the person),
- and other continua now discarded and forgotten.

Throughout the process, however, I perceived that the themes in the taxonomy fell into two large and somewhat discrete categories: *volitional* nonuse

and *compelled* nonuse. The terms "volitional" and "compelled" and the distinction between them did *not* appear explicitly in the literature examined for the pilot study. However, an ordering along a volitional-compelled continuum quickly developed into a dichotomy. Many of the themes had only *compelled* elements, and *volitional* elements usually had *compelled* counterparts. This bifurcation between volitional and compelled permitted me to visualize the universe of nonuse of information clearly enough to identify the portion of particular interest to me. Because my academic interest gravitates to the topic of societal injustice (e.g., Houston & Erdelez, 2004), and because the "compelled" portion of the universe of nonuse of information appeared to be associated with and underlie examples of social injustice, I narrowed the scope of research from nonuse in general to *compelled* nonuse of information (CNI). Support and encouragement from my dissertation committee, particularly Dr. Diane Schallert, substantiated the choice of this new focus of research.

A survey of theories and examples of information behavior

To provide a disciplinary context to this study of CNI, the informal pilot study continued with an investigation of *use* of information, generally referred to as "information behavior." This investigation proved to be extremely useful for two reasons. First, the results of the investigation provided an overview of the current treatment of CNI in the literature of information science and demonstrated the need for a more expansive treatment. Second, the information behaviors found through the investigation provided insight into the various conditions

leading to CNI, as noted in column 3 of Appendices 2 and 3. For example, Chatman's Alienation Theory (item 3 in Appendix 2), that most life events are meaningless to the alienated, resolved to isolation (element 2.1), resignation (element 6.1), and least conflict (element 6.2).

To conduct the investigation of information behaviors, I started with the book edited by Fisher et al. (2005), in which various authors described 72 theories and examples of information behavior. Citation tracing and keyword searches led to another 52 theories and examples of information behavior. After merging six theories with similar theories that appeared under different names, 118 theories and examples of information behavior remained. Appendices 2 and 3 list the 103 theories and 15 examples of information behavior identified through the informal pilot study, accompanied by citations (column 1) and earliest discoverable dates of publication (column 2). The theories and examples of information behavior appear in Appendices 2 and 3 because they satisfied my informal criteria, primarily, that scholars such as Case (2002) and Fisher et al. (2005) recognize them as theories and examples of information behavior. Behaviors also appear in Appendices 2 and 3 because their authors labeled them with acronyms (e.g., CMC, ELIS, ISIC, ASK, PAIN, CSCW). Although not definitive, the presence of an acronym could reflect a somewhat formalized body of substantiating thought. It also could reflect a "presence" in the literature of information science or in the conversations of information researchers frequent enough to justify the acronym as a shorthand label. For whatever reason, an

acronym indicated a need to consider including the behavior so named in Appendices 2 and 3.

Comparison of the taxonomy with the theories of information behavior

The next phase of the informal pilot study consisted of a merging of the preliminary version of Figure 1.1 (the taxonomy of conditions leading to CNI) with column 1 of Appendices 2 and 3 (theories and examples of information behavior). This merging consisted of noting the explanatory power of each element of the taxonomy for each theory or example of information behavior. By "explanatory" I mean that the elements of the taxonomy might provide an analytical framework that would provide a more comprehensive understanding of the information behavior. In addition, "explanatory" refers to that facilitating of conceptualization in that the relatively few elements of the taxonomy would be easier to conceptualize than would be the scores of theories of information behavior. For example, Alienation Theory (Chatman, 1990) postulates that information and most life-events are meaningless to the alienated due to powerlessness, futility of jobs, physical isolation, lack of trust of others, self-estrangement, and lack of "fit" (normlessness). I compared Chatman's Alienation Theory with the elements of Figure 1.1, based on my familiarity with the elements. Did isolation (element 2 in Figure 1.1) help to describe Alienation Theory? Yes, in this example, work schedules caused social, physical, and temporal isolation of night-working janitors that prevented their interaction with society and contributed to a concise description of Alienation Theory. Proceeding

through the taxonomy in this manner, I determined that I could describe the behavior of Alienation Theory through three elements of CNI: element 2, environmental (physical, temporal, and social) barriers; element 6.1, resignation; and element 6.2, least conflict. In another example, "affect" (element 5.3 in Figure 1.1) described Affective Load Theory (Nahl, 2004). When applied to the 118 theories and examples of information behavior in Appendices 2 and 3, CNI described 55 of these 118 behaviors through the six elements of the taxonomy. The other 63 theories and examples described information *use* (e.g., berrypicking, by Bates, 1989) rather than nonuse, or information behaviors unconnected to use and nonuse (e.g., Cognitive Work Analysis, by Rasmussen et al., 1994). Establishing correspondences between the taxonomy and the information behaviors in Appendices 2 and 3 revealed overlapping definitions among the elements of the taxonomy. Resolving these overlaps led to refining the taxonomy by defining the nuances of its elements.

A heuristic for defining, and a definition of, CNI

Spradley and McCurdy (1972, pp. 68-70) postulated a typology of definitions as shown in Figure 3.3:

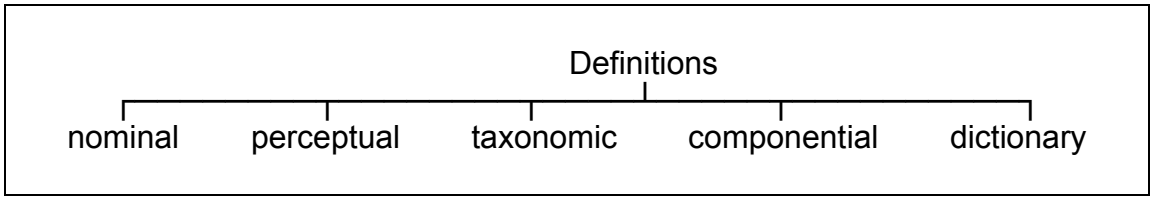

Figure 3.3: Spradley and McCurdy's typology of definitions.

Although Spradley and McCurdy did not discuss it, their typology of definitions, when listed in the order of:

1) nominal,
2) perceptual,
3) taxonomic,
4) componential, and
5) dictionary,

creates a methodology for defining a previously undefined "definiendum" (Latin: that which is to be defined). In other words, Spradley and McCurdy's sequence of definitions creates a plan of action for defining a "definiendum" where the "definiendum" and the "definiens" (Latin: that which is doing the defining, or, the definition) represent new concepts. The methodology appears graphically in Figure 3.4 below.

nominal definition →	**perceptual** definition →	**taxonomic** definition →	**componential** definition →	**dictionary** definition

Figure 3.4: The sequence of definitions for new concepts.

This study used this sequence of Spradley and McCurdy's types of definitions as a methodology to define nonuse of information, as follows.

1. Nominal definitions

Nominal definition, that is, definition of an object by naming it, facilitates subsequent discussion but does not define any object other than the object in question and does not relate the object to other objects or differentiate the object from other objects. For example, I point to an object and say "that is a 'chair'." For

that object, then, I have assigned the name "chair." This assigning facilitates further discussion of that object, but it does not define similar objects or differentiate the "chair" from other objects.

For the informal pilot study, I assigned nominal definitions to concepts that represented to me examples of nonuse of information. These nominal definitions consisted of combinations of each of the three words: information / knowledge / message with each of the four words nonuse / avoidance / rejection / refusal, and permutations of those combinations. For example, one such combination resulted in "information nonuse," and a permutation of that combination resulted in "nonuse of information." As noted above, the informal pilot study of various popular and scholarly literatures identified approximately 400 works that used one or more of these nominal definitions.

2. Perceptual definitions

Perceptual definitions derive from perceptions. For example, "I perceive this chair … and I perceive this other chair … and this one …." As with nominal definitions, this perceptual definition does not define "chair" in a way that allows others to define "chair," but it does begin to constrain the discussion of chairs to an agreed upon group of objects.

In the approximately 400 works identified in the informal pilot study, I perceived several dozen examples of nonuse of information. These several dozen examples began to cluster into groups with similar characteristics, each group appearing discrete.

3. Taxonomic definitions

Taxonomic definitions result from arranging perceptual definitions into a taxonomy, rather than a listing without order. The arrangement can take the form of a hierarchy by utilizing more inclusive and less inclusive characteristics, or it can utilize one or more continua. The phenomenon to be defined, then, is any item appearing in the taxonomy. To continue the previous example of chairs, a hierarchical taxonomy would consider, for example, suspended chairs as different from chairs that rest on the floor. Among chairs that rest on the floor, some have legs, and some have casters. Among chairs that have legs, some have three legs, and some have four. Another taxonomy might organize the chairs along continua such as weight or price. All the objects in these taxonomies, however, are chairs, and "chair" can be defined as any object in these taxonomies.

In this study, I created a preliminary taxonomy of nonuse of information. Over the course of the study, I refined this preliminary taxonomy into the taxonomy of Figure 1.1. Other taxonomies might define CNI as well as that of Figure 1.1, and a second example appears in Appendix 5. I chose the taxonomy of Figure 1.1 for two reasons. First, the taxonomy of Figure 1.1 appeared to offer a view of CNI with more degrees of difference than the taxonomy of Appendix 5, a finer-grained and more nuanced picture of CNI. Second, the taxonomy of Appendix 5, a taxonomy based on the transmission model of communication, is a

focus of controversy among some scholars of information science and related disciplines (e.g., MacKay, 1969; Reddy, 1979, 1993; Underwood, 2003).

4. Componential definitions

Componential definitions represent an inductive counterpart to a deductive *taxonomic* definition. In other words, while a *taxonomic* definition defines an object by its presence in a taxonomy (arguing deductively from the general to the specific), a *componential* definition defines an object by its component attributes (arguing inductively from the specific to the general). For example, from the taxonomy of chairs, we can define a chair by the characteristics common to all the chairs in the taxonomy, specifically: a) a piece of furniture that holds your weight off the floor, b) has a part that keeps you from falling over when you lean back, and c) usually accommodates one person.

This study uses a componential definition of CNI derived from the elements of the taxonomy (Figure 1.1). In other words, each element of the taxonomy has several components. Most of the components of each element are unique to that element. Some components, however, are common to all of the elements of the taxonomy. The components common to all elements of the taxonomy are these:

a) The presence of a behavior, for example, eating beef.

b) The presence of information that might have altered that behavior, for example, evidence that BSE ("Mad Cow Disease") might exist in the local food supply (McWilliams, 2004).

c) The presence of a compulsion beyond the control of the person committing the behavior. In other words, the nonuse of information is compelled nonuse (CNI) rather than volitional nonuse (VNI) because the person has no control over the conditions leading to the nonuse. For example, the nonuse could be caused by unawareness of the information (because it appeared in a small, somewhat local magazine), fear of the unknown (if a person already has eaten infected beef, then that person may have contracted the incurable BSE), perceiving the information as not worth the time needed to obtain it ("I won't bother, because they'll find a cure anyway"), or mistrust of the source ("you can't trust that magazine").

d) The continuation of the behavior, in this example, continuing to eat beef.

Componential definitions, then, consist of a statement of the components common to all examples of a phenomenon.

5. Dictionary definitions

Dictionary definitions, to be useful, must define a concept in terms of its previously defined component concepts. For that reason, *dictionary* definitions of new concepts cannot precede the definition of the component concepts. In the example of chairs, we rely on previously accepted definitions of "furniture,"

"seat," "back," and "person" to define a chair as a piece of furniture that has a seat, a back, and usually accommodates one person. Others may improve upon this definition, but, in general, we have defined "chair" well enough to discuss chairs.

The following *dictionary* definition of CNI employs the common elements that make up the *componential* definition of CNI (listed above). The common factors of CNI find expression in this dictionary definition, first given in Chapter 1:

CNI describes behaviors beyond the control of a person, behaviors that do not allow a difference to make a difference.

This *dictionary* definition evolved from expression of the *componential* definition, which derived from analysis of the *taxonomic* definition, which consisted of *perceptual* definitions based on *nominal* definitions.

Pragmatism

Although I did not realize it when I formulated them, the definition heuristic of the previous section and the retroduction heuristic of the following section both rested on the philosophical school known as American pragmatism. Charles Sanders Peirce formulated pragmatism in the late 1800s based on his reading of Immanuel Kant (Dewey & McDermott, 1981, p. 42). Peirce's extraordinarily unconventional patterns of behavior led to the suppression of his writings, particularly his autobiographical writings, for up to 80 years after his death in

1914 (Brent, 1996, p. 32). This suppression is important to an understanding of pragmatism because Peirce published relatively little during his life. Much of his thought emerged only through his autobiographical material. Thus, it fell to Peirce's colleagues such as William James, John Dewey, George Herbert Mead, and Oliver Wendell Holmes, Jr. to interpret pragmatism and to apply it to other fields. More recently, pragmatism grounds the philosophy of Van Fraassen, who calls pragmatism "constructive empiricism" (Godfrey-Smith, 2003, p. 184).

As noted earlier, Peirce described pragmatism by his "pragmatic maxim":

> Consider what effects, that might *conceivably* have practical bearings, you *conceive* the objects of your *conception* to have. Then, your *conception* of those effects is the whole of your *conception* of the object. (1905, p. 481; reprinted in 1931-1958, v. 5, p. 438)

By this statement, Peirce equated a concept to its practical consequences. Elsewhere, he related pragmatism specifically to behavior:

> [T]he maxim of pragmatism is that a conception can have no logical effect or import differing from that of a second conception except so far as, taken in connection with other conceptions and intentions, it might conceivably modify our practical conduct differently from that second conception. (1903, reprinted in 1931-1958, v. 5, p. 196)

I interpret this statement as meaning that conceptions can be judged only by the behavioral responses that they stimulate. I applied Peirce's pragmatism to two areas of the study reported here: to the concept of nonuse of information and to the methodology of this study.

First, I looked at the psychologic implications of nonuse of information. The discipline of psychology could incorporate explanations of nonuse of information via several of its major schools of thought: Freudian

psychodynamics, Skinnerian behaviorism, Neisser's cognitive psychology, or combinations of the three. I narrowed the psychologic implications of the study to behavior, specifically the behavior of nonuse of information, rather than expand the discussion to the psychodynamic or cognitive effects of nonuse. I did so because the behavioral effects of nonuse of information are more easily observable than its psychodynamic or cognitive effects, and pragmatism postulates that the effect (which must be observed) *is* the conception, itself. Psychodynamic and cognitive terms appear in the study reported here, but the study focuses on behavior, specifically the behavior of not using information.

Second, the concept of pragmatism underlies the two heuristics developed for this study. The definition heuristic described in the previous section exemplifies pragmatism, in that the definition type resulting from each step: nominal → perceptual → taxonomic → componential → dictionary (Figure 3.4) *equals* the process required to derive that step. In other words, each of the definition types *is* its effect on the subsequent definition type, as Peirce defined an object to be its effect. Thus, pragmatism creates in this definition heuristic something of a chain of equivalencies, in which the last definition, a dictionary definition, is as trustworthy as the nominal definition that initiated the chain. This line of reasoning justifies the definition of CNI as "behaviors beyond the control of a person, behaviors that do not allow a difference to make a difference."

With respect to the methodology of this study (the retroduction heuristic), pragmatism underlies Peirce's concept of retroduction (abduction):

> If you carefully consider the question of pragmatism you will see that it is nothing else than the question of the logic of abduction. That is, pragmatism proposes a certain maxim which, if sound, must render needless any further rule as to the admissibility of hypotheses to rank as hypotheses, that is to say, as explanations of phenomena held as hopeful suggestions; and, furthermore, this is all that the maxim of pragmatism really pretends to do, at least so far as it is confined to logic, and is not understood as a proposition in psychology. For the maxim of pragmatism is that a conception can have no logical effect or import differing from that of a second conception except so far as, taken in connection with other conceptions and intentions, it might conceivably modify our practical conduct differently from that second conception. (Peirce, 1931-1958, v. 5, p. 196)

Peirce postulated retroduction as an iterative process consisting of formulating, testing, reformulating, and retesting retroductive suggestions. For this study, I created a nine-step heuristic for the performance of retroduction, described in the next section. The retroduction heuristic derives from steps described by Peirce (1976b, pp. 319-320) and by his follower Rennie (1998, p. 111).

A retroduction / abduction heuristic for investigating CNI

To some extent, the entire process of this study (brainstorming, pilot study, formal study, and re-study) followed the iterative pattern of retroduction. In other words, the retroductive suggestions generated by brainstorming were refined and tested in the pilot study, the retroductive suggestions generated in the pilot study were refined and tested in the formal study, and the retroductive suggestions generated in the formal study were refined and tested in the re-study. This cyclical, iterative process of generation, testing, reformulating, and retesting synopsizes the retroductive method. The following sections explain in more detail the process of retroduction and its application to this study of CNI.

An introduction to retroductive (or "abductive") reasoning

Retroductive reasoning shares many characteristics with grounded theory. This study used retroductive reasoning instead of grounded theory for several interrelated reasons, many of which Rennie (1998) has expressed. As further explained below, retroductive reasoning lends itself to the study of newly identified phenomena, while methods such as grounded theory have been used effectively in areas with established vocabularies or previous studies. Retroductive reasoning "forgives" the lack of a starting point, and that lack of a starting point characterizes newly recognized phenomena. Conversely, the prescribed procedures of grounded theory apply to studies that build on pre-existing investigations. CNI has no pre-existing, coherent body of literature, a fact that recommends the use of retroductive reasoning to investigate CNI.

People develop ideas by inductive reasoning, deductive reasoning, and retroductive reasoning. As used in this study, induction is "reasoning from observations to theories" (Honderich, 1995, p. 405), while deduction is reasoning from theories to observations, or, "inference where from a given set of premisses [*sic*] the conclusion must follow" (p. 181). In the initiation of exploratory studies such as this study, however, where neither prior systematic observations nor theories exist, the researcher will find both inductive and deductive reasoning inapplicable. "All the ideas of science come to it by the way of Abduction [Retroduction]." (Peirce, 1931-1958, pp. 144-145, from Peirce's "Harvard Lectures on Pragmatism"). Peirce, the primary theorizer of retroduction during his

long, prolific, and largely unpublished writing career, equated retroduction with terms such as "intuition," "hunch," "guess," "presumption," "apagögé," "extremely fallible insight," "explanatory hypothesis," "problematic theory," "probational adoption of the hypothesis," and "inference to the best explanation leading to a scientific hypothesis" (after Bergman & Paavola, 2001). According to Peirce, retroductive reasoning might lead to a higher proportion of false starts than would reliance on deductive or inductive reasoning, but the exploration of a new idea would permit of no other method of reasoning:

> Abduction is no more nor less than guessing, a faculty attributed to Yankees. (---) Such validity as this has consists in the generalization that no new truth is ever otherwise reached while some new truths are thus reached. (1976b, pp. 319-320, from Peirce's 1902 "Prolegmena").

This study, an exploration for Peirce's "new truth," employs Peirce's retroduction.

Peirce, a classically trained physical scientist, mathematician, and logician, recognized well the pitfalls of performing retroduction, at times calling it a process of thought "capable of producing no conclusion more definite than a conjecture" (1976b, pp. 319-320, from Peirce's 1902 "Prolegmena"), and at times saying:

> Abduction, although it is very little hampered by logical rules, nevertheless is logical inference, asserting its conclusion only problematically or conjecturally, it is true, but nevertheless having a perfectly definite logical form. (1931-1958, pp. 188-189, from Peirce's 1903 "Harvard Lectures on Pragmatism")

A nine-step heuristic for the performance of retroductive / abductive reasoning

Peirce and his followers postulated nine steps that would ensure the rigor of the retroductive method. I have termed the nine steps a heuristic because they comprise a somewhat flexible method of providing a reasonably close approximation of an answer to a question. This heuristic suits the retroductive method because retroduction seldom leads to a conclusion. Instead, retroduction leads to a suggestion that forms the basis for further investigation. Neither Peirce nor his followers ever presented a complete heuristic, but Rennie (1998, p. 111) articulated steps 3-5, Peirce (1976b, pp. 319-320) suggested others in his various writings, and Bergman and Paavola (2001) added nuances that clarified the process. I have constructed from their work the following nine-step heuristic to investigate CNI in the study reported here.

1. Perceive a phenomenon leading to surprise: the breaking up of a belief or conception
2. Perform the fundamental and primary retroduction: that CNI can be studied, even without prior systematic observations or theorizations
3. Synthesize the new phenomenon into a judgment, hypothesis, or retroductive suggestion
4. Bracket intuitive prejudices
5. Immerse in the data
6. Conceptualize
7. Hypothesize
8. Select the hypothesis most efficient to entertain, interrogate, or test
9. Entertain the hypothesis, interrogate the hypothesis, or test the hypothesis by experiment.

Fuller explanations of the nine steps follow.

1. Perceive a phenomenon, leading to surprise.

Peirce defined surprise as "some belief, active or passive, formulated or unformulated, [which] has just been broken up" (1998, p. 287, from Peirce's 1903 "A Syllabus of Certain Topics of Logic"). The surprised performer of retroduction must have formed the belief prior to being surprised, but the retroductive method begins with the surprise rather than the prior formation of the belief.

The phenomenon of nonuse of information surprised me. I had studied information use for 12 years, and I had never thought about nonuse, except to deplore isolated examples such as censorship, propaganda, anti-intellectualism, and prejudice. I began to search for examples, and I was surprised to find in the literature very few treatments of nonuse, as such, while I could think of so many examples. I began to see connections and similarities among the examples, and I began to search for larger treatments of nonuse of information. Searches of databases of scholarly literature revealed a few dozen examples in a few hundred articles, but no comprehensive treatments. With encouragement from my doctoral advising committee, I began to see the study of nonuse as a worthwhile addition to information science, in part because it seemed such a common behavior and in part because information researchers largely had ignored it.

2. Perform a fundamental and primary retroduction.

Perform a fundamental and primary retroduction, for example, "that the facts in hand admit of rationalization, and of rationalization by us" (Peirce, 1931-1958, p. 219, from Peirce's 1901 "On the Logic of drawing History from Ancient Documents").

The database searches produced examples of nonuse that appeared to be well defined but extremely limited in application and interpretation. I observed that the examples bore relationships, one to another, although no such relationships appeared explicitly in the works discussing the examples. For example, Chatman found that the poor demonstrated "a heavy use of television for escape and for surveillance" of their environments (1985, p. 277). Yet, no one appeared to have linked her work with "avoidance of stimuli that inform rather than entertain" (McLuhan & Fiore, 1967; Graber, 1989) or the scholarship of propaganda (e.g., Lasswell, 1927, 1949). I retroduced that this study could identify, define, and connect such examples and that this study would be feasible, understandable, and worth the effort to conduct.

3. Synthesize the new phenomenon into a judgment, hypothesis, or retroductive suggestion, based on fallible insight.

In this step, the researcher synthesizes the new phenomenon into a new conception or general hypothesis (Peirce, 1931-1958, p. 181, from Peirce's 1903 "Harvard Lectures on Pragmatism").

The more I looked at examples of nonuse, the more I began to see concise explanations of information behavior when viewed as nonuse rather than use. I had not counted theories of information use at that time, but I knew that scores existed. Thus, I could envision the creation of a classification scheme based on a few elements of nonuse of information rather than on scores of theories of information use. Further, the classification based on nonuse appeared to have internal consistency, that is, each element bore a relationship to the elements next to it, while the scores of theories of information use stood largely in isolation. The classification of nonuse appeared to have great potential as an explanatory model of conditions that could lead to CNI, a model for employment by information professionals, so I formed the retroductive suggestion that an explanatory model of *nonuse* could organize and facilitate the study of information behavior, a field currently laboring under its current emphasis on information *use*.

4. Bracket intuitive prejudices about the phenomenon.

Peirce discussed intuitive prejudices only indirectly, in step 8 below. In step 4, Rennie (1998, section following the introduction) refers to:

> attempting to set biases aside (i.e., to put them in 'brackets', as phenomenologists describe the tactic); and by being as explicit as possible about them when writing up the returns from their studies.

I had intuitive prejudices about nonuse of information, that it somehow was morally "bad," ubiquitous, virtually invincible, invisible to most, and seductive, rather like a Christian devil or Arabian genie. I observed the prevalence of that

intuitive prejudice in the literature of information science (e.g., C. Harris, 1984), education (e.g., Alexander et al., 1997), and law (e.g., Baarsma, 2002). I kept this intuitive prejudice before me when I began to collect examples of nonuse of information. Among those examples, I found nonuse of information that could *benefit* the nonuser. For example, psychodynamic defense mechanisms permit a person to survive, to remain sane, or to function in the presence of unpleasant information (e.g., Freyd, 2006). In other words, nonuse, as such, seems neither helpful nor harmful to the potential nonuser, and the nonuser is neither morally good nor bad by not using information. What did appear in the examples, however, was an indication of the difference between *volitional* nonuse of information and *compelled* nonuse of information. This realization allowed me to identify many compelled rather than volitional examples of nonuse of information and to narrow this study to an investigation of compelled nonuse of information (CNI).

I had another intuitive prejudice about nonuse of information, this one involving the nature of authoritarianism and its employment of CNI to control others. I viewed authoritarianism with suspicion and its mechanisms of control as alarming because such control lends itself to abuse as controllers seek self-aggrandizement or perpetuation of their control at the expense of the controlled. However, some amount of authoritarian control and manipulation of information can benefit the controlled. For example, against the threat of species extinction by means of an environmental "tragedy of the commons" (Schmuck & Vlek,

2003), many (e.g., Hardin, 1968) assert that only a measure of authoritarian control can regulate the use of the commons in a far-sighted manner. The regulation may be by physical force or by manipulation of information, tactics identified by Servan (1767, p. 35, quoted by Foucault, 1977, p. 102):

> A stupid despot may constrain his slaves with iron chains; but a true politician binds them even more strongly by the chain of their own ideas; it is at the stable point of reason that he secures the end of the chain; this link is all the stronger in that we do not know of what it is made and we believe it to be our own work.

The sources of the most powerful of "their own ideas" are, almost by definition, hidden: "The very efficacy of inviolate rules depends on their being abstracted from any social context or set of conventions--they just *are*." (Burbules, 1986/2002, p. 342) Any act of selection involves omission of the phenomena not selected. For example, the selection of ideas involves the omission of the ideas not selected. For this reason, the control of slaves (to use Servan's word) by "their own ideas" comprises a form of CNI in which "their own ideas" (ideas fostered by an authority) preclude other ideas (ideas that might weaken the authoritarian control). These other ideas constitute nonused information.

5. Immerse in the data.

Peirce did not discuss immersion in the data, and Rennie merely mentioned it and implied the necessity of comprehensive immersion: "the adherence to a conceptualization thus conceived [step 6, following] is contingent on its being supported by *the data as a whole* [emphasis added]" (1998, p. 111).

This step presents the question of what constitutes data in the study reported here.

In this study of examples of CNI that appear in the published literature, I treat each example of CNI as a datum, following the precedent set by the science of bibliometrics. In 1922, bibliometrics (then called bibliographical statistics and, before that, bibliography) added quantitative methods to its formerly used set of qualitative methods (cf. Hulme, 1923; Krzys, 2005, p. 292) to permit the description of the evolution of various sciences through metrics applied to their literatures. Analysts first used books as data, then other works such as journal articles, and then the books' and articles' references and citations. In this expansion of subject matter, particularly in the analysis of references and citations, the methodology of bibliometrics regained the qualitative component (*how* a bibliographic datum was mentioned, rather than just the fact of its being mentioned) that the shift from bibliography to bibliographical statistics to bibliometrics had de-emphasized:

> At first, there were citation counts which were used to indicate importance of journals; these counts being statistical did not consider the quality of a work. Ultimately, the citations themselves were closely examined as indicated in many research papers. (Krzys, 2005, p. 317)

For his dissertation about the obsolescence of books in college libraries, Gosnell (1943) used three collections of books as populations (Krzys, 2005, p. 292), implying the legitimacy of the use of a book as a datum. His dissertation used books, book chapters in edited volumes, and journal and conference articles as sources for the study. In 1978, Nicholas and Ritchie identified

descriptive ("describing the characteristics or features of a literature") and evaluative ("examining the relationships formed between components of a literature") components of bibliometrics. Krzys paraphrased Nicholas and Ritchie:

> Although all the descriptive studies are not evaluations, all the evaluative analyses are first descriptive with the evaluative taking the data one step further, providing 'data on the condition or character of the literature as a whole.' (Nicholas & Ritchie, 1978, quoted in; Krzys, 2005, p. 296)

In the study reported here, I searched for and evaluated published examples of CNI and treated those examples as data, using a technique similar to evaluative bibliometrics. To evaluate the examples, I determined the manner of usage of the examples in the published works and the relationship of the examples to CNI.

As described earlier, I conducted an informal pilot study that examined various literatures for occurrences of nonuse of information (see Figure 3.2). I performed similar searches in other databases such as Google Scholar, Altavista, and meta-search engines such as Dogpile, Clusty, and Ez2find. Concluding the searches, I compiled a comprehensive list of examples of nonuse of information as presented in the literatures indexed by the mentioned databases.

A discussion of the limitations on such immersion appears in the next section, limitations such as examples that eluded the searches because of different vocabulary, examples that never were published or that appear so seldom as to avoid even an apparently exhaustive search, examples that predate the databases searched, and examples in literatures not indexed by the databases used.

6. Form new conceptions bearing some degree of ordering.

With this step, the performer of retroduction / abduction forms conceptions contingent on support by "the data as a whole" (Rennie, 1998, p. 111).

With the manifestations of nonuse of information produced during the informal pilot study, I began to compile lists of conditions that might cause nonuse. I ordered these lists of conditions along the ordinal continua of:

- apparent strength with respect to somatic and cognitive thresholds,
- source of the condition (external or internal to the nonuser),
- susceptibility of the condition to mitigation,
- nature of initiation (somatic or cognitive), and
- status as either compelled or volitional.

These lists of conditions illustrated the nature of the conditions as either compelled or volitional, and I decided to narrow the scope of this study to compelled nonuse of information (CNI). I developed an ordinal taxonomy of conditions that lead to CNI (see Figure 1.1). As noted above, I also created a taxonomy of conditions based on the transmission model of communication, sometimes known as the Shannon-Weaver model (see Appendix 5). I chose the ordinal taxonomy for two reasons, as explained earlier in this chapter. The ordinal taxonomy has a more nuanced picture of CNI, and the Shannon-Weaver model arouses controversy about the suitability of information theory as a model for communication other than that studied by telephone engineering.

7. Hypothesize for the surprising phenomenon.

This step merges into the previous step because conceptualizations about the whole body of data lead to conceptualizations accounting for the novel data

that caused the initial surprise. Peirce interchangeably used other phrases to label this step, for example, "invention of the hypothesis" (1985, from an unpublished Peirce manuscript, 1901).

As the examples of CNI accumulated, I created hypotheses about the structure of an explanatory model of CNI. The taxonomy of Figure 1.1 represents the hypothesis selected, as the next section explains.

8. Select the most efficient hypothesis.

Select the hypothesis most economical to follow (Peirce, 1976a, pp. 37-38, from Peirce's 1902 "Carnegie Application"). Peirce defined economy in terms of money, time, thought, and energy (1931-1958, p. 600, from Peirce's 1903 "Lowell Lectures"). Peirce also advised the researcher to select a hypothesis "so long as this preference is not based upon any previous knowledge bearing upon the truth of the hypotheses, nor on any testing of any of the hypotheses, after having admitted them on probation" (1931-1958, pp. 524-525, from Peirce's 1901 "Hume on Miracles"). I conclude from this statement that Peirce was warning in the first case ("previous knowledge") against using intuitive prejudices that had not been bracketed, and in the second case ("testing") against using what the business world calls "sunk costs," that is, the resources already expended, unrecoverable, and not affecting the cost-benefit ratio (the efficiency) of future expenditures.

Peirce's admonition to select the most efficient and economical hypothesis bears a superficial resemblance to the concept known as parsimony or Occam's

Razor. However, while parsimony/Occam's Razor prefers the hypothesis that introduces the fewest assumptions and postulates the fewest hypothetical entities, Peirce's efficiency and economy derive from the money, time, thought, and energy required to test the hypothesis. As such, Peirce's efficiency and economy resemble strongly his pragmaticism (William James's pragmatism), because his pragmaticism emphasizes the effects of a concept. In other words, Peirce admonished us to select a hypothesis based on its effect. With retroduction, testing the hypothesis should have a *minimal* effect on the resources required to do the testing.

I hypothesized that an explanatory model of CNI *could* exist, that I could develop it, and that it would prove useful in understanding the empirical examples of information behavior that occur in the literature of information science and related fields and in the practice of information professionals.

9. Inductively verify the hypothesis against the data as a whole.

Peirce referred to this step also as entertainment of the hypothesis (1985, p. 895, from Peirce's 1901 "The Proper Treatment of Hypotheses"), or interrogation, or testing by experiment of the hypothesis (pp. 898-899). I conclude that this step in the performance of retroduction justifies the use of the term "retroduction" rather than "abduction," although I have not found this justification stated so explicitly in Peirce's works. He says only: "I have on reflexion [*sic*] decided to give this kind of reasoning the name of *retroduction* to imply that it turns back and leads from the consequent of an admitted

consequence, to its antecedent." (quoted in Bergman & Paavola, 2001; n.d., pp. 4-5) I agree with Peirce's renaming of the method, because "abduction" implies to me a drawing away from the consequence with the direction being unspecified, whereas "retroduction" implies a drawing away from the consequence to its antecedent, as Peirce stated. "Retroduction" also implies to me a returning, and in this sense, I treated the hypothesis of step 8 as both the outcome of retroduction and as the font of new retroductions, returning or looking back to a prior step in the retroductive process. Specifically, I looked back to the last point at which I had perceived a phenomenon leading to a surprise. That point followed the pilot study, with the realization that nonuse of information consisted of CNI and VNI, and that this study should focus on CNI. I re-entered the retroduction cycle at Step 3, synthesizing the new phenomenon into a hypothesis. That hypothesis took the form of the taxonomy depicted in Figure 1.1. Re-entering the retroduction cycle, I reminded myself of Step 4, bracketing intuitive prejudices, and began Step 5, immersion in the data, with the "Formal Study," reported in the next section.

A search for examples of CNI and formulation of a final taxonomy

A central component of the study reported here was the search of the 13 print and electronic databases in Appendix 1 for the search terms listed in Figure 3.5. These search terms included the terms used during the pilot study and terms thought of later or suggested by members of the dissertation advising committee, such as "barrier":

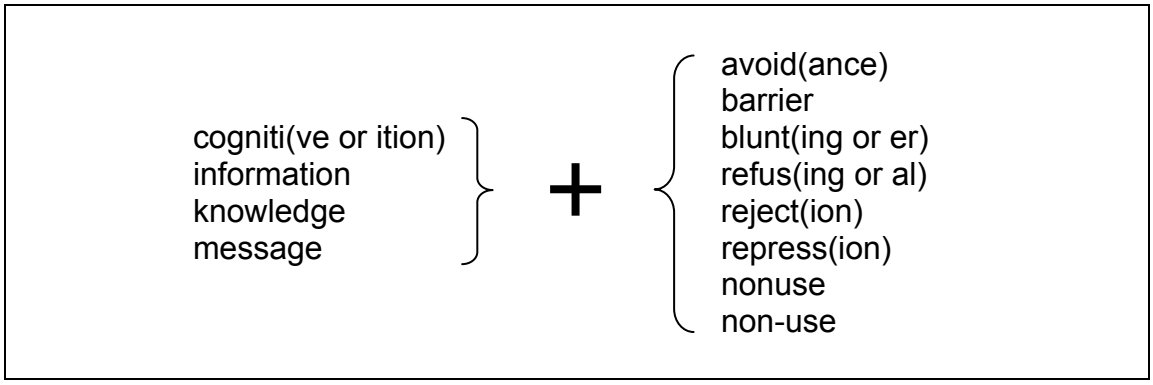

Figure 3.5: The formal study search for examples of nonuse of information via keyword searches.

The results of this search generated no completely new conditions leading to CNI, but they did suggest sharper definitions of the existing conditions and a reorganization of parts of the taxonomy.

The search resulted in approximately 1,400 articles that contained some form of the search terms. Many of these articles contained chance juxtapositions of the search terms; many contained examples of information *use*, rather than *nonuse*; and many did not contain sufficient information to determine whether the described nonuse was compelled or volitional. From the approximately 1,400 articles, 114 presented examples of CNI, and these 114 appear here in Table 3.2:

Author and date	**Sources of articles**
1. Agrawal et al. (2007)	*Journal of Marketing Research (JMR), 44*(1), 100-113.
2. Aldoory & van Dyke (2006)	*Journalism & Mass Communication Quarterly, 83*(2), 346-361.
3. Arsenault & Castells (2006)	*Information, Communication & Society, 9*(3), 284-307.

Author and date	Sources of articles
4. Azaiza & Cohen (2006)	*Journal of Women's Health, 15*(5), 520-530.
5. Baarsma (2002)	*Journal of Criminal Law & Criminology, 93*(1), 23.
6. Baker (1980)	*Journal of Business Communication, 17*(3), 33-43.
7. Ball-Rokeach et al. (1981)	*Public Opinion Quarterly, 45*(1), 58.
8. Bergen Jr. (2001)	*Education, 122*(1), 154.
9. Birch (1990)	*Developmental Psychology, 26*(4), 515-519.
10. Black & Fung (1983)	*Annual Review of Information Science and Technology, 18*, 307-354.
11. Brandon (2006)	*Educational Studies, 40*(2), 196-208.
12. Broderick (2005)	*Cognitive Therapy & Research, 29*(5), 501-510.
13. Brooks et al. (2003)	*Journal of Applied Psychology, 88*(5), 904-914.
14. Brunel & Pichon (2004)	*Journal of Consumer Behaviour, 3*(4), 360-374.
15. Burden (1991)	*Counselling Psychology Quarterly, 4*(4), 331.
16. Cheah (2006)	*Asian Journal of Communication, 16*(3), 293-314.
17. Cho & Cheon (2004)	*Journal of Advertising, 33*(4), 89-97.
18. Chute & Wiener (1996)	*International Journal of Aviation Psychology, 6*(3), 211-231.
19. Clerk (2007)	*American Annals of the Deaf, 152*(1), 5-19.
20. S.W. Cornelius & Caspi (1987)	*Psychology and Aging, 2*(2), 144-153.
21. Crawford (1978)	*Annual Review of Information Science and Technology, 13*, 61-81.
22. Cronin (2005)	*Annual Review of Information Science and Technology, 39*, 395-432.
23. Deveney & Deldin (2004)	*Emotion, 4*(3), 295-304.
24. Dimaggio et al. (2006)	*Psychology & Psychotherapy: Theory, Research & Practice, 79*(4), 495-516.
25. Dimaggio et al. (2002)	*Journal of Psychotherapy Integration, 12*(4), 421-451.

Author and date	Sources of articles
26. Dore (1994)	*Journal of Social Work Education, 30*(1), 97-106.
27. Downing (2006)	*Intervention in School & Clinic, 42*(2), 67-77.
28. Eisen et al. (2007)	*Developmental Psychology, 43*(6), 1275-1294.
29. Eisenstadt et al. (2002)	*Self & Identity, 1*(4), 289-311.
30. Everill & Waller (1995)	*European Eating Disorders Review, 3*(3), 129-147.
31. Faris & Smeltzer (1997)	*Journal of Business Communication, 34*(1), 7-26.
32. File, et al. (1993)	*Human Psychopharmacology: Clinical & Experimental, 8*(3), 195-202.
33. Floyd & Clements (2005)	*International Journal of Listening, 19*, 39-50.
34. Foa & Kozak (1986)	*Psychological Bulletin, 99*(1), 20-35.
35. Freyd (2006)	*Behavioral & Brain Sciences, 29*(5), 518-519.
36. Fry & Prentice-Dunn (2005)	*Health Communication, 17*(2), 133-147.
37. Garmon (2005)	*Educational Studies, 38*(3), 275-286.
38. Gernsbacher (1993)	*Psychological Science, 4*(5), 294-298.
39. Gernsbacher & Faust (1991)	*Journal of Experimental Psychology: Learning, Memory, and Cognition, 17*(2), 245-262.
40. Gernsbacher & Robertson (1995)	*Psychological Science, 6*(3), 165-169.
41. Giacalone et al. (2007)	*Psycho-Oncology, 16*(4), 365-370.
42. Godlee et al. (2004)	*Lancet, 364*(9430), 295-300.
43. Goldsmith (1999)	*Research on Language & Social Interaction, 32*(4), 303.
44. Granfield (2002)	*Journal of Alcohol & Drug Education, 47*(2), 18.
45. Greenwood (1997)	*Lancet, 349*(9058), 1041.
46. Hamblin et al. (1984)	*Journal of Clinical Psychology, 40*(6), 1510-1516.
47. Haynes (1988)	*Quarterly Journal of Speech, 74*(1), 71-99.
48. Hemsley-Brown & Sharp (2003)	*Oxford Review of Education, 29*(4), 449-471.

Author and date	Sources of articles
49. Hoffmann (2004)	*ETC: A Review of General Semantics, 61*(1), 75-79.
50. Hofmann et al. (2005)	*Emotion, 5*(4), 464-475.
51. Ikpeze & Boyd (2007)	*Reading Teacher, 60*(7), 644-654.
52. Jacobson (2001)	*CyberPsychology & Behavior, 4*(6), 653-673.
53. Jones & Leary (1994)	*Health Psychology, 13*(1), 86-90.
54. Kalichman et al. (2006)	*Health Psychology, 25*(2), 205-210.
55. Keller et al (2003)	*Journal of Marketing Research (JMR), 40*(1), 54-64.
56. Klaczynski et al. (1997)	*Journal of Educational Psychology, 89*(3), 470-485.
57. Kreling et al. (2006)	*Psycho-Oncology, 15*(12), 1065-1076.
58. Kupermintz & Salomon (2005)	*Theory Into Practice, 44*(4), 293-302.
59. Kuyken et al. (2006)	*Journal of Abnormal Psychology, 115*(3), 387-396.
60. Laney & Loftus (2005)	*Canadian Journal of Psychiatry, 50*(13), 823-828.
61. R. J. Lewis et al. (1986)	*Journal of Personality, 54*(4), 676.
62. Lips & Colwill (1988)	*Canadian Psychology Psychologie Canadienne, 29*(1), 57-68.
63. McKnight (2006)	*Journal of the Medical Library Association, 94*(2), 145-151.
64. L. M. Meyer (2000)	*Theory Into Practice, 39*(4), 228.
65. Meyers (2002)	*Journal of Educational & Psychological Consultation, 13*(3), 151-183.
66. Mickiewicz (2005)	*Political Communication, 22*(3), 355-380.
67. Mikulincer et al. (2003)	*Personality & Social Psychology Review, 7*(1), 20-40.
68. R. F. Miller & Tighe (1974)	*Annual Review of Information Science and Technology, 9*.
69. Mills (1965)	*Journal of Personality and Social Psychology, 2*(4), 589-593.
70. Mills & Jellison (1968)	*Journal of Personality and Social Psychology, 8*(1), 59-62.

Author and date	Sources of articles
71. Moradi et al. (2006)	*Journal of Counseling Psychology, 53*(1), 57-66.
72. Morgan & J. K. Miller (2002)	*Journal of Applied Communication Research, 30*(2), 163.
73. Muha & K. S. Smith (1998)	*Journal of Health Communication, 3*, 109.
74. Nickerson (1998)	*Review of General Psychology, 2*(2), 175-220.
75. Olson (1995)	*Philosophy & Rhetoric, 28*(1), 45-68.
76. Owens (2006)	*AAC: Augmentative & Alternative Communication, 22*(3), 196-208.
77. Palmer & Carter (2006)	*Communication Law & Policy, 11*(1), 1-34.
78. Parks & Toth (2006)	*Aging, Neuropsychology & Cognition, 13*(2), 225-253.
79. Paulson (2002)	*Reading Psychology, 23*(1), 45-66.
80. Perse & Ferguson (1993)	*Journalism Quarterly, 70*(4), 843-853.
81. Pinquart (2002)	*Experimental Aging Research, 28*(3), 317-336.
82. Pratkanis & Gliner (2004)	*Current Psychology, 23*(4), 279-304.
83. Radeborg et al. (1999)	*Ergonomics, 42*(5), 767-777.
84. Ray (2003)	*Journal of Applied Communication Research, 31*(3), 185.
85. Rhodes & Wood (1992)	*Psychological Bulletin, 111*(1), 156-171.
86. Richards (1997)	*Journal of Public Policy & Marketing, 16*(1), 156-162.
87. Riskind et al. (2006)	*Journal of Social & Clinical Psychology, 25*(7), 779-801.
88. T. Rogers (1998)	*Communication Review, 2*(4), 497.
89. Rose & Rudolph (2006)	*Psychological Bulletin, 132*(1), 98-131.
90. Rousseau et al. (1998)	*Psychology & Marketing, 15*(7), 643-662.
91. Rubin (1988)	*Journalism Quarterly, 65*, 368-375.
92. Scott & Stradling (1997)	*Journal of Traumatic Stress, 10*(3), 523-526.
93. Sedikides & Green (2000)	*Journal of Personality and Social Psychology, 79*(6), 906-922.

Author and date	Sources of articles
94. Seife (2001)	*Science, 291*(5508), 1472.
95. Shehryar & Hunt (2005)	*Journal of Consumer Psychology, 15*(4), 275-287.
96. Sherman et al. (2000)	*Personality and Social Psychology Bulletin, 26*(9), 1046-1058.
97. Shermer (2004)	*Scientific American, 290*(5), 46.
98. Simon-Arndt et al. (2006)	*Health Communication, 20*(1), 13-22.
99. Soliah et al. (2006)	*College Student Journal, 40*(4), 729-739.
100. Sprinkle et al. (2006)	*Communication Education, 55*(4), 389-402.
101. Stovall-McClough & Cloitre (2006)	*Journal of Consulting and Clinical Psychology, 74*(2), 219-228.
102. E. Taylor & J. W. Rogers (2005)	*Journal of Child Psychology & Psychiatry, 46*(5), 451-467.
103. Tsang (2002)	*Review of General Psychology, 6*(1), 25-50.
104. Turk (2004)	*Annual Review of Sociology, 30*(1), 271-286.
105. M. M. Turner et al. (2006)	*Human Communication Research, 32*(2), 130-156.
106. Tyree & T. A. Fiore (1994)	*Remedial & Special Education, 15*(6), 363.
107. Volk (2007)	*Journal of the Medical Library Association, 95*(2), 203-207.
108. Weaver (1959)	*Speech Monographs, 26*(4), 273.
109. Weisgerber (2004)	*Information, Communication & Society, 7*(4), 554-574.
110. Williams et al. (2007)	*Psychological Bulletin, 133*(1), 122-148.
111. Witte (1992)	*Communication Monographs, 59*(4), 329-349.
112. Wolfson (2006)	*Death Studies, 30*(2), 113-120.
113. Xie (2007)	*Educational Gerontology, 33*(5), 429-450.
114. Zulu (2003)	*AILA Review, 16*(1), 52-61.

Table 3.2: Authors, dates, and sources of articles containing examples of CNI.

A summary of the retroductive procedure employed in this study

In any investigation involving retroduction, the outcome of the retroductive process determines the next step in the investigation. If the retroduction has produced a hypothesis testable by inductive or deductive methods, the investigation progresses to those methods. If the retroduction has produced a completely unexpected hypothesis, the investigation returns to Step 1 of the retroduction heuristic and again proceeds through Step 9. If the investigation produces neither a surprise nor a testable hypothesis, the investigation returns to Step 5 and again proceeds through Step 9. This third possibility occurred twice during the study reported here, as diagrammed in Figure 3.6 below. In the first iteration of retroduction, the pilot study consisted of a database search for terms derived from brainstorming and led to the preliminary taxonomy (steps 1-9). The results of the first iteration did not produce a hypothesis testable by inductive or deductive methods, and it did not produce a surprise that would justify starting again at Step 1. Therefore, the study returned to Step 5, the formal study. The formal study consisted of a database search for terms derived from interrogation of preliminary taxonomy, and the results of this second iteration consisted of two taxonomies, depicted in Figure 1.1 and Appendix 5. The third iteration of retroduction consisted of a repeat of the formal study, but this time using the taxonomy of Figure 1.1 to re-code the corpus.

Retroductive step:	Iteration 1:	Iteration 2:	Iteration 3:
1. Surprise	Brainstorming		
2. Retroduce	"nonuse exists"		
3. Synthisize	"nonuse explains"		
4. Bracket	"not bad; not good"		
5. Immerse	pilot study of nonuse and IBs	formal study of CNI	re-coding the corpus
6. Conceptualize	first taxonomy	second taxonomy	tweaking the taxonomy
7. Hypothesize	nonuse → CNI	third taxonomy	tweaking the taxonomy
8. Select	first taxonomy	second taxonomy	tweaking the taxonomy
9. Interrogate	"almost, but not quite"	"almost, but not quite"	"on to induction or deduction"

Figure 3.6: A summary of the retroductive procedure employed in this study.

Methodological limitations of this study

Several factors inherent in the methodology of this study potentially limit its quality:

1) the context of the study,
2) the applicability of applying reductionism to information behavior,
3) a lack of trustworthiness of the data,
4) a lack of rigor in the retroductive reasoning process, and
5) a lack of prior theory underpinning CNI.

The next five sections describe each limitation more fully and indicate why the methodology of this study is sufficient for its purposes and does not suffer unduly from these limitations.

1. Limitations imposed by the context of the study

Step 4 of the retroduction heuristic, bracketing intuitive prejudices, forces the practitioner of retroduction to consider some of the factors that influence the outcome of the retroductive process. But, just as the fish cannot see the water, a practitioner cannot identify fully (to say nothing of neutralizing) the effects of a study's context. With respect to this study, I am certain that my life experience, the need to satisfy my school (under its own constraints), and the life experiences of each of my faculty advisors have influenced the conduct and outcome of this study. Contextual limitations, however, apply to virtually all behavior. I rely, therefore, on Peirce's Pragmatic Maxim and claim that this study will be judged by its effect on disciplines in the Humanities and Social Sciences, and not on its contextual limitations.

2. Limitations imposed by application of reductionism to CNI

The method of philosophical inquiry known as reductionism rests on the assumption that a phenomenon can be explained by analysis of its components, while holism asserts that unique properties emerge from considering the phenomenon as a whole, a view popularly summarized as "the whole is more than the sum of its parts." Reductionism occurs in several permutations: scientific, philosophical, theoretical, methodological, ontological, hierarchical, mathematical, linguistic, and legal. In virtually all permutations, the propriety of applying reductionism rests on the question: "Is this phenomenon explained more completely and understandably by holism or by reductionism?" The hierarchical

reductionism proposed by Dawkins (1986, p. 13) provides a clue to the explanatory power of reduction, describing complex systems as a level in a hierarchy of organizations. CNI, for example, occupies one level of the hierarchy depicted in Figure 3.7 below. Describing CNI in terms of information behavior (which is one level above CNI in the hierarchy of Figure 3.7) requires consideration of hundreds of information behaviors that compel nonuse of information (examples appear in Appendices 2 and 3). Similarly, studying CNI as a collection of sociological, political, economic, and psychologic principles (which are two levels below CNI in the hierarchy of Figure 3.7) requires a large number of those principles. Studying CNI by reducing it to the somatic and cognitive barriers one level below it, however, reduces CNI to the parsimonious six elements of the taxonomy of Figure 1.1 above. Conversely, viewing CNI holistically does not reveal emergent phenomena or causality from higher levels of the taxonomy to CNI. In other words, the sum of its parts is *not* greater than the whole. This parsimony of reduction and the ineffectiveness of holism justify the use of the reductionism used in this study of CNI.

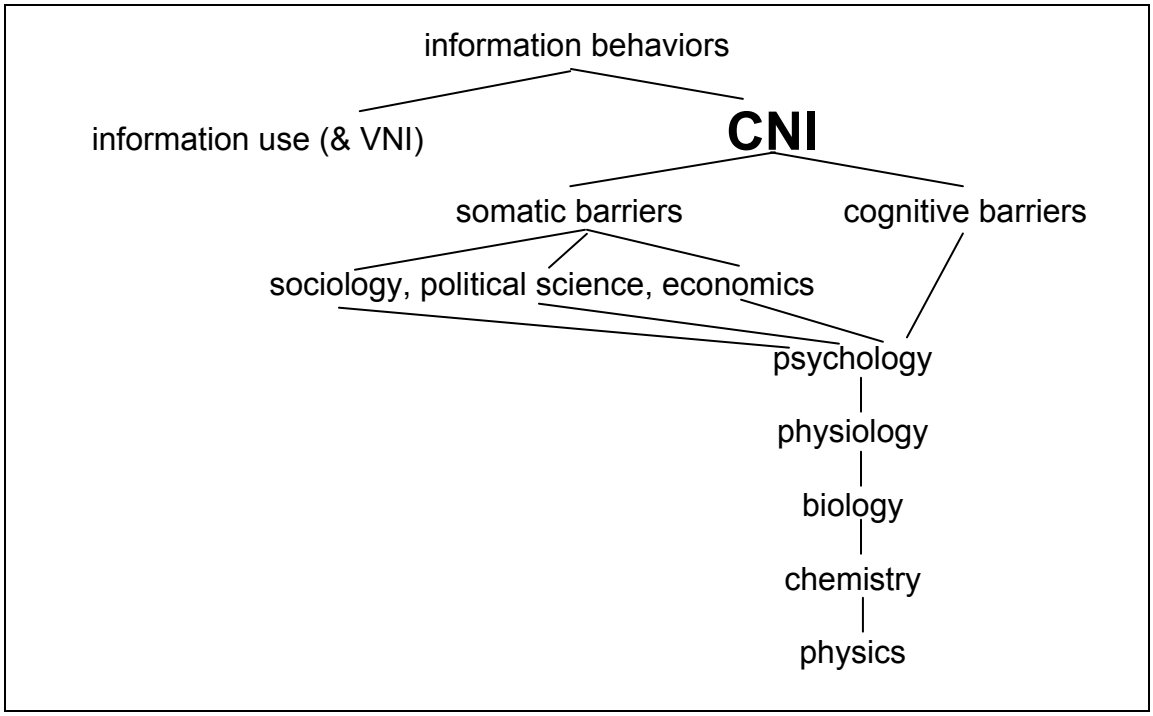

Figure 3.7: Hierarchical reductionism as applied to CNI.

3. Limitations imposed by the trustworthiness of data

The analysis of CNI reported here may not be comprehensive because of two reasons, lack of inter- and intra-coder reliability testing, and limitations of the vocabulary used for searching the literatures. I did not attempt to re-code the corpus of the pilot study or to measure the reliability of my coding (intra-coder reliability) because the purpose of the pilot study was to develop concepts rather than data. I did re-code the corpus of the formal study, as will be explained. I did not attempt inter-coder reliability testing of the formal study because of the exploratory nature of this study. The vocabulary used to search the various literatures, that is, the set of search terms, was limited by its sources: my dissertation committee, the pilot study, and subsequent analysis of the pilot study

data. Other examples of nonuse of information might exist under different terminology. The literature search, however, proceeded beyond the point at which new elements of the taxonomy emerged, similar to the concept of data saturation. In other words, new elements ceased to appear, but this study may have overlooked extremely infrequent elements.

The taxonomic elements reported in this dissertation, however, provide a sufficiently firm foundation for further research. This sufficiency has two bases: the concept of data saturation mentioned in the preceding paragraph and the nature of the explanatory model of CNI. The explanatory model presents an ordering of types of elements, similar to the Periodic Table's ordering of elements. When Mendeleev formulated his early versions of the Periodic Table of the Elements, he noted gaps and predicted that chemists would fill the gaps with newly discovered elements. In fact, his predictions came true (Thall, 2006). Elements of CNI may not possess an integer interrelationship similar to the periodicity of the elements (based on the integers one through eight). Rather, they may possess an ordinal and hierarchical interrelationship similar to the *Systema Naturae* of Carl Linnaeus (1735; Quammen, 2007). Just as Mendeleev's Periodic Table based on atomic *weight* led to the modern Periodic Table based on atomic *number*, and as Linnaeus's taxonomy based on *morphology* led to modern taxonomy based on *genetics*, the CNI taxonomy of this study might lead to further such study of information behavior. Thus, the

value of this study rests primarily on its existence and methodological rigor and only secondarily on its comprehensiveness.

4. Limitations imposed by a lack of rigor in the performance of retroductive reasoning

According to Walton (2004, p. 4),

> Logicians have tended to be not very welcoming to the idea of allowing abductive inference as part of logic, because logic is supposed to be an exact science, and abductive inference appears to be inexact.

This claim to inexactness stems less from the *method* (retroduction / abductive inference) and more from the *novelty of the topic* undergoing retroduction, whatever that topic may be. With deduction and induction, the researcher works from the known to the unknown. With retroduction, the researcher works from the unknown to the possible. Stated another way, when embarking on an exploration of the unknown, the researcher MUST start with retroduction. As noted earlier, Peirce asserted that "no new truth is ever otherwise reached while some new truths are thus reached" (1976b, pp. 319-320, from Peirce's 1906 "Prolegmena"). Therefore, according to Peirce, while retroduction may lead to false starts, no research has started otherwise, that is, without Peirce's "surprise." To mitigate the inexactness inherent in the retroductive method, an inexactness stemming from a lack of prior systematic observations and theories and leading to only probable conjectures, I formulated and followed the retroduction heuristic, the nine-step methodology suggested by Peirce and his followers.

5. Limitations imposed by the lack of prior theory underpinning CNI

Although CNI has scant theoretical underpinning at this time, its explanatory model still can facilitate the study of information behavior. Further study will provide that underpinning and modify or substantiate the taxonomy.

The use of a model without theoretical underpinning finds precedent in bibliometrics. For example, Brookes (1969) said:

> The Bradford law [that a few journals carry most of the important articles] remains empirical until it is better understood. But if it can be demonstrated to be widely applicable, reliable and useful in practical operations, there is no need to wait until the underlying theory is completely established.

Wilkinson (1972) added:

> Despite the limitations of our understanding of such laws, then, Bradford promises useful application in the design of more rational and economic information systems.

In fact, others did refine and expand Bradford's Law, as stated by Hertzel (2003, p. 317), justifying its early use and continued study.

The lack of theory in this presentation of the CNI taxonomy may disappoint those who have a different concept of the word "theory" and require empirical support and predictability. According to Kaplan (1964, pp. 294-302), however, classifications function very much like theories, making sense of disturbing situations. Classifications identify and name the phenomena of interest, cluster them, and create a structure of their relationships (after Kwasnik, 1992, p. 63). The taxonomy does just that, identifying, naming, clustering, and structuring conditions leading to CNI and, thereby, creating something of a theory in Kaplan's view.

Summary of Chapter 3

The methodology presented in this chapter:

- pilot study,
- formulation of heuristics,
- creation of the taxonomy / explanatory model / classification scheme, and
- comprehensive literature search

resulted in the taxonomy of CNI presented in the next chapter, Chapter 4. As Chapter 2 demonstrated, scant prior discussion now exists about CNI. The taxonomy of Chapter 4 may have limitations, but it should be sufficient to facilitate discussion about CNI.

CHAPTER 4: THE TAXONOMY OF CONDITIONS LEADING TO CNI

This chapter explains Figure 1.1 above, the taxonomy of conditions compelling nonuse of information, starting with a discussion of the criteria used in ordering the taxonomy. Other orderings might be possible, and this section explains the ordering chosen for this dissertation. A discussion of the dichotomous nature of CNI-VNI follows, and then the chapter presents an explanation of the elements of the taxonomy. When considered together, the examples of CNI represented by the elements of Figure 1.1 comprise a *taxonomic* definition of CNI, one of the five types of definitions identified by Spradley and McCurdy (1972), as explained in Chapter 3 above.

Criteria used in ordering the taxonomy

The taxonomy in Figure 1.1 (above) presents conditions that compel the nonuse of information. Several criteria determined the order of the elements of the taxonomy in Figure 1.1:

1) the magnitude of the condition,
2) cognitive involvement, and
3) the direction of the condition.

Magnitude

The conditions appear in the taxonomy in order of my estimation of their "magnitude," the amount of additional information needed to create a *use* of information from the *nonuse*. In other words, conditions at the top of the taxonomy, such as element 1 (intrinsic somatic conditions), would require a

smaller intervention of additional information to overcome the condition than would conditions further down the list, such as element 6 (information filtering). Note that placement in the taxonomy does not suggest whether a condition *should* be mitigated, only how it *could* be mitigated.

Cognitive involvement

The conditions also appear according to my estimation of the amount of cognition involved in the nonuse, from least cognitive (most somatic) to most cognitive (least somatic). In other words, mitigation of a condition toward the top of the taxonomy would invoke less cognition than a condition lower on the page. Two important concepts modify the concept of cognitive involvement: *timing* and the *traceability* of cognition.

Timing refers to the duration of the nonuse of information. From a practical standpoint, nonuse exists only when it affects behavior. In other words, when a person must react to information before consciously thinking about the information, the person has not used the information. The game "Simon Says" provides an example. When a person responds correctly in the game, that person's response usually follows a traceable process of cognition: "The caller said 'Simon says.' I should move." Or, "The caller did not say 'Simon says.' I must not move." If the person responds incorrectly, the incorrect response usually comes just before the thought: "Oh no! I did that incorrectly!" Most people can play Simon Says at slow speeds. A rapid game, however, reduces the opportunity for cognition and increases the opportunity for CNI.

Traceability of cognition, the second concept, refers to Figure 1.4 above (the continuum of cognition with respect to nonuse of information), in which cognition appears as an interrupted continuum from intuition to induction to deduction (*Concise Routledge encyclopedia of philosophy*, 2000, p. 403). As explained in that section of this dissertation, traceable cognition generally implies VNI, while intuition implies CNI. To convert that cognition continuum into a dichotomy requires the establishment on that continuum of a point that demarks volitional cognition from compelled cognition, and the position of that point depends on the concept that I have called "timing." As implied in the paragraph above, if a person does not react to information without consciously thinking about the information, the person has engaged in CNI. If, however, the person can trace the thoughts that led to the nonuse of information and still does not react to the information, the person has engaged in VNI. The source of the information does not affect this determination, so whether the information comes from the person's memory or from another source, the same criteria apply.

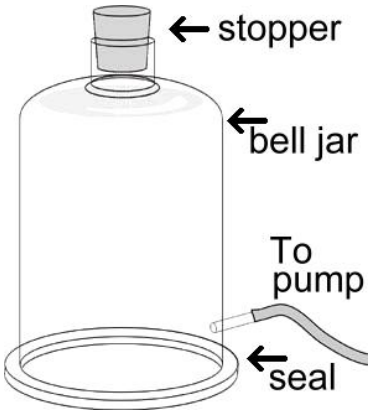

Figure 4.1: The analogy of the bell jar.

<u>The direction of the condition</u>

The taxonomy also describes the "direction" of the condition, as either a "push" or a "lack of pull." The analogy of the bell jar

(Figure 4.1) illustrates this concept. The bell jar is an early form of the vacuum chamber, a rigid container from which a pump removes air. The bell jar is unique among vacuum containers, however, because it is made of glass, permitting observation of events inside the jar. For the bell jar analogy to work, I assume that humans normally *use* information (allow information to make a difference). When humans do *not* use information, some part of their information-using system has performed abnormally. Similarly, the bell jar system, when sitting unused, would allow air to enter the jar. When in operation, however, the bell jar system keeps air out of the jar. When air enters an operating bell jar system, some part of the system has failed. Failure (air flowing into the jar) will occur when the jar is not strong enough to push against the outside air or when the pump does not pull air out of the jar strongly enough. If the bell jar system represents a person, then air leaks represent use of information. The jar itself represents the *somatic* barriers listed in Figure 1.1 above, pushing to keep the air out, and pump weakness represents a "lack of pull" resulting from the *cognitive* barriers listed in Figure 1.1. Leaks (use of information) will increase when the somatic barriers do not "push" strongly enough, or when "lack of pull" from cognitive barriers increases. For example, nonuse of information will increase as the somatic barrier "censorship" (element 3 in Figure 1.1) increases or as the cognitive barrier "engrossment" decreases the "pull" for information. See Table 4.1, following, for a more graphic representation of the push/pull dichotomy. Note

that "push" and "pull" here are, by definition, precognitive or intuitive and beyond the control of the person.

SOMATIC BARRIERS: Conditions that "push" against information:	**COGNITIVE BARRIERS:** Conditions causing a "lack of pull":
trauma	lack of threshold knowledge
psychological predispositional mismatch	engrossment / distraction
social barriers	affect
physical / temporal barriers	priming
censorship	least effort
mis- / disinformation	least conflict

Table 4.1: The directions in which CNI barriers act.

Other methods of ordering the elements of the taxonomy

Instead of the taxonomy of Figure 1.1 or the taxonomy based on the transmission model of communication (Appendix 5), the elements of CNI could appear along other continua such as "internal to external causation" or in other dichotomies such as "awareness-unawareness." These two orderings appear below. I considered these taxonomies but preferred the taxonomy of Figure 1.1 because it followed three orderings: magnitude, cognition, and direction, while the taxonomies described below each followed only one ordering: internal to external in the first example, and awareness to unawareness in the second.

Internal to external causation

In a continuum of internal to external causation, the taxonomy would change as shown in Table 4.2:

The taxonomy of Figure 1.1, magnitude, cognition, & direction: →	**The taxonomy of Table 4.2, internal to external causation:**
Intrinsic somatic conditions	Intrinsic somatic conditions
Socio-environmental barriers	Threshold knowledge shortfall
Authoritarian controls	Attention shortfall
Threshold knowledge shortfall	Information filtering
Attention shortfall	Socio-environmental barriers
Information filtering	Authoritarian controls

Table 4.2: An alternative ordering of the elements of the taxonomy, based on an internal-to-external continuum.

The ordering of Table 4.2 would require re-evaluation of the role of the external "others" in several elements. For example, illiteracy (element 4.1) would appear toward the "internal" end of the continuum, while mutually unintelligible languages (element 4.2) would appear toward the "external" end of the continuum. In the taxonomy of Figure 1.1, these elements occur contiguously. In other words, the two taxonomies are not compatible.

Awareness-unawareness

A dichotomy of awareness-unawareness would re-organize the taxonomy at the level of the sub-sub-elements. For example, lexical priming (element 5.4.1) and priming via naïve conceptions (element 5.4.3) would appear on the "unaware" side of the dichotomy, while priming with respect to the source (element 5.4.2) would appear on the other side. In the taxonomy of Figure 1.1,

these elements occur contiguously. In other words, the two taxonomies are not compatible. I chose the taxonomy of Figure 1.1 over the "internal-to-external" ordering and the "awareness-unawareness" ordering because it followed three orderings: magnitude, cognition, and direction. In other words, the taxonomy of Figure 1.1 explains more about CNI than do the other orderings.

Length of explanations of the elements of the taxonomy

The descriptions of the six primary elements of the taxonomy require markedly different numbers of pages in the dissertation. Two possible reasons appear for this difference. First, some elements might be more complex than others and necessitate longer explanations. Second, the descriptions use examples from two specific corpora of literature. Selection of different or additional corpora might result in a different distribution of page lengths.

Explanations of the elements of the taxonomy

Conditions leading to CNI appear in the taxonomy as independent, discrete elements. In the 114 articles that comprise the corpus of the formal part of this study, CNI frequently resulted from two or more elements or as one element leading to another. For the purposes of forming the taxonomy, however, I describe the elements as independent, with occasional interrelationships noted. The six primary conditions leading to CNI appear here in the order of the taxonomy: the three somatic barriers; then the three cognitive barriers.

Somatic barriers to use of information

Somatic barriers involve a person's body, as with externally induced trauma or as the result of intrinsic somatic barriers such as psychological predispositions. Examples of somatic barriers to use of information appear below. CNI induced by somatic barriers may exceed a threshold of physical perception, and the person may be aware of the condition, for example, deafness or social disadvantage. In other situations, the person may be unaware of barriers such as authoritarian censorship, which may keep even the act of censorship hidden from the person. Somatic barriers to use of information fall into three broad categories, outlined in Figure 4.2 and described below.

Somatic barriers to use of information

1 **Intrinsic somatic conditions**: physical barriers on which changes in socio-environmental or authoritarian controls will have little effect

2 **Socio-environmental barriers**: physical barriers on which changes in somatic abilities or authoritarian controls will have little effect

3 **Authoritarian controls**: physical barriers on which changes in somatic abilities or socio-environmental conditions will have little effect

Figure 4.2: Somatic barriers that cause CNI.

1. Intrinsic somatic conditions

Intrinsic somatic conditions describe conditions due to causes within the body that contribute to CNI and on which changes in socio-environmental or authoritarian conditions will have little effect. For example, government

censorship of a newspaper has little effect on the nonuse of information from that newspaper by a person who cannot read. Intrinsic somatic conditions can be congenital (present at birth) or induced by subsequent trauma. For the purposes of creating a taxonomy of CNI, the time of onset of the condition (congenital or subsequent) is more a matter of curiosity than a guide to diagnosis or mitigation. For example, neither the person born blind nor the person subsequently blinded will be able to read a newspaper.

Intrinsic somatic conditions occur in many forms and can provoke the compelled nonuse of information through several mechanisms. The following sections present intrinsic somatic conditions that appeared in the study corpus. The intrinsic somatic conditions appear in the following order, an order explained in the introduction to this chapter.

1) congenital abnormalities and subsequent trauma leading to physical impairments,
2) trauma leading to psychological predispositions,
3) intrinsic psychological predispositions, and
4) intrinsic somatic conditions of uncertain origin.

These four groupings overlap, in that they occasionally contain examples that would appear to fit in more than one group. When an example could be placed in more than one group, I placed it in the group that, in my opinion, reflected the chronologically earliest cause of CNI. For instance, if an article discussed a psychological predisposition *and* the trauma that led to the predisposition, I placed the example in the section about trauma. *Within* the four groups, the barriers appear in an approximate chronological order, that is, in the order in

which they might occur in a person's lifetime. Many of these barriers could appear at almost any time during a lifespan, so the order of examples *within* the groups is a matter of convenience for the author and does not affect the taxonomy.

1.1) Congenital abnormalities or trauma leading to intrinsic somatic conditions, such as blindness, deafness, or abnormal brain size and configuration

Intrinsic somatic conditions frequently result from trauma before birth or during early childhood. E. Taylor and J. W. Rogers (2005, pp. 452-460) cataloged a number, including:

- toxic influences in pregnancy such as alcohol,
- maternal psychological disturbance such as stress,
- perinatal risk factors such as low birth weight,
- toxic chemicals in the environment, such as lead,
- infective causes such as Lyme disease,
- selective deficiencies such as iodine deficiency,
- head injury, and
- neglect and malnutrition.

In addition to this list of potential adversities for the perinatal and young, Taylor and Rogers (p. 463) also found that:

> Adversities do not come singly. Much of the research reviewed has been ingenious in trying to isolate the effects of one stressor in the presence of others, with experimental correction of the problem, or quasi-experimental studies of defined influences such as episodes of heavy metal pollution, or with multivariate statistical correction for possible confounders. In practice, many problems often coexist and need several kinds of intervention.

In other words, genetic predispositions, environmental stressors, and the presence of other adversities could intensify each of the adversities and its

impact on developmental disorders, leading to intrinsic somatic conditions and CNI.

Trauma occurring later in life also results in intrinsic somatic conditions. Greenwood (1997, p. 1041) described the traumatic amnesia that accompanies closed-head injury and suggested that the duration of the amnesia correlated positively with the severity of the trauma:

> The best predictors of outcome after closed head injury remain behavioural measures rather than neuroimaging or electrophysiological or biochemical findings, as is also the case after stroke. Of the behavioural measures studied, the duration of post-traumatic amnesia has been shown repeatedly to be one of the best single predictors of residual problems with cognitive function or functional independence--better, in many studies, than the depth or duration of coma.

The Greenwood article thus implied that closed head injury caused amnesia, a compelled nonuse of the information that the person with the head injury might otherwise have recalled.

Physical impairments present a barrier to information use. Owens (2006, on visual impairment) and Downing (2006, on mild to moderate learning and behavior problems) described the nonuse of information caused by several impairments and suggested guidelines that government, educators, and businesses might adopt to mitigate this CNI. Owens suggested adaptations for the visually impaired, such as simplified language, Braille and large-print formats, and graphic modifications such as wide spacing of text and the use of contrasting colors. Downing proposed school media centers with special equipment for the disabled. T. Rogers (1998, p. 503), citing Stubbins (1988, p. 25), however,

described power relationships between the impaired and the non-impaired that would forestall any such adaptations:

> For Stubbins a disability may be viewed as a particular type of relationship between impaired persons and the social and physical environment. The impaired person is part of a relationship that is built into the structure of our institutions and society. It is a relationship in which the able-bodied have power over those with impairments. This power is played out in the ability of the able-bodied to define a disability from their perspective.

Where Stubbins is correct and the able-bodied world intentionally does not accommodate the impaired, two elements of the taxonomy would combine to prevent the use of information. First, the impairment prevents the use of information (e.g., deafness blocking sound from a movie). Second, authoritarian control (described further in Section 3 below) denies access to the impaired (e.g., producers of movies do not caption most movies).

1.2) Trauma leading to psychological predispositions, such as dissociation, amnesia, false memories, and selective attention (habituation) through homeostasis

A number of examples from the corpus discussed the effect of trauma (described above) on psychological predispositions (described below). Specific examples described here are dissociation, homeostasis and habituation, neuro-chemical mandates, and natural aging.

Dissociation frequently results from trauma and manifests as a "disruption in the usually integrative functions of consciousness, memory, identity, or perception of the environment," according to Everill and Waller (1995, p. 129), quoting earlier editions of the *Diagnostic and Statistical Manual of Mental*

Disorders: DSM-IV-TR (American Psychiatric Association, 2000). According to Everill and Waller, this disruption affects the individual through selective attention and selective memory, both of which compel nonuse of information (CNI). Eisen et al. (2007, p. 1292) described the dissociation that accompanied childhood abuse:

> Trauma-related psychopathology and poor cognitive functioning were significant predictors of memory inaccuracy. For example, regarding trauma related psychopathology, being highly dissociative and mounting a greater stress response as well as self-reporting more trauma symptoms were associated with increased memory error for stressful medical procedures.

In addition to accompanying trauma, dissociation also accompanies posttraumatic stress disorder (PTSD). Some people view aspects of PTSD as volitional, rather than compelled, however, as when General Patton famously slapped the soldier with PTSD. Stovall-McClough and Cloitre (2006, p. 226) labeled *avoidance* of reminders of the trauma that led to PTSD as volitional and labeled *dissociation* resulting from PTSD as non-volitional:

> PTSD avoidance is primarily volitional and does not interfere with an individual's orientation to the present (time, space, and place). Dissociation, on the other hand, is an involuntary process that has the effect of removing one from a present orientation (i.e., losing time, feeling like two people, feeling outside one's own body).

Dissociation, whether from trauma or from PTSD, results in compelled nonuse of the information that the person with the head injury or PTSD might otherwise have recalled from memory.

Homeostasis, the maintenance of the body's internal environment (Cannon, 1932) through *habituation* ("a reduced response to repeated

presentation of the stimulus," Craighead & Nemeroff, 2004, p. 624) can result in CNI. For example, a person living beside a highway becomes desensitized to the sounds of traffic. Habituation can prevent harm in some cases and cause harm in others, demonstrating the importance of evaluating CNI without the prejudice that nonuse of information is bad. For this reason, the statements of causing and preventing harm that appear in the study corpus do not affect the taxonomy. Flood (1975, p. 45) presented an example of homeostasis preventing harm:

> Continued increases exceed the threshold of discrimination, leading to sensory decreased discrimination and finally to shock. Continuation in duration rather than intensity results in a chronic stress reaction à la Selye. ... [T]he filtering mechanism actually serves as a physiologic and psychologic homeostatic mechanism.

Flood's example presents homeostasis as more of a physiologic than a psychologic manifestation of habituation. Section 6.1 below discusses psychologic manifestations, specifically, information overload. Foa and Kozak (1986, p. 27) postulated a mechanism to explain habituation as helpful in the therapeutic treatment of some forms of pathological anxiety:

> [H]abituation constitutes information that changes a fear structure. When physiological responses decrease during confrontation with feared situations, interoceptive information about the absence of physiological arousal is generated. … The resultant less “unitized” configuration of elements is less readily evoked by information that matches only some of the elements in the structure.

In this example, the habituation altered a physiological predisposition (the inherent memory structure for a particular fear), reducing the response to negative affect (element 5.3 of Figure 1.1). Such therapeutic habituation, however, does not always reduce responses. M. J. Scott and Stradling (1997)

indicated that attempts at habituation produced less effect in some cases of Posttraumatic Stress Disorder (PTSD), and that the more severe the PTSD, the less successful the habituation:

> Clients seen in clinical practice seem likely to benefit from exposure treatments if they find them acceptable, but many do not. Data from both studies here suggest those with more severe symptoms and those with higher levels of co-morbid depression may be the clients least likely to tolerate exposure treatments. (p. 526)

Whether preventing or causing harm, homeostasis and habituation compel the nonuse of information.

Neuro-chemical mandates, for example, drugs or alcohol, can compel nonuse of information. In the use of sedatives during dental treatment, File et al. (1993, p. 201) reported:

> During actual dental treatment with sedation two possible coping strategies emerged. In some patients the drug treatment induced complete amnesia for items presented after drug administration, and in this respect midazolam was the more effective drug. Alternatively, patients showed relative cognitive avoidance of dentally-related words, but for superficially coded words this avoidance strategy was prevented by midazolam.

Some might consider chemical-induced amnesia to be desirable in the case of dental treatment. Yet, some might feel that the preferential destruction of the right-brain caused by ingestion of alcohol (Hamblin et al., 1984, p. 1514) is not desirable:

> This study showed that older, chronic alcoholics do substantially worse than younger alcoholics on right hemisphere tasks. As noted, further analyses also revealed that alcohol appears to assert a more pressing influence on decline than age on complex nonverbal abstract tasks, but that age seems to assert a prepotent influence on more visualspatial tasks. This study … does revalidate alcoholic aging decline in a chronic alcohol population and

> suggests, further, that alcohol and aging do interact with each other to assert a strong influence.

Dental sedation and alcohol ingestion result in CNI, and again the question of whether the CNI prevents or causes harm does not affect the taxonomy.

Advanced age, as mentioned above, interacts with alcohol to influence strongly "complex nonverbal abstract tasks." Advanced age *alone* also affects the ability of a person to use information:

> Because of changes in acuity and sensitivity, older adults may have a reduced likelihood of noticing and encoding warnings; because of changes in working memory capacity, older adults may have a reduced likelihood of comprehending warning information and complying with it. (Rousseau et al., 1998, p. 657)

Giacalone et al. (2007, p. 365) found that "Elderly patients may also be affected by sensory deficits, cognitive impairment and functional deficits that might require more kindness." In this example, the socio-environmental factor of prejudice against those of advanced age (described in Section 2 below) can enhance or reduce the effects of advanced age on CNI. S. W. Cornelius and Caspi (1987, p. 152) found that, in adults, advanced age increased some aspects of intelligence (which I define for the purposes of this study as the measure of the ability of a person to be changed by information) while it decreased others:

> Intelligence is a multifaceted construct encompassing diverse abilities and skills. Notwithstanding methodological issues inherent in developmental research, conclusions about changes in intelligence in adulthood and old age are problematic because different facets of intellectual behavior and functioning manifest distinctive patterns of development, stability, and decline.

Specifically, Cornelius and Caspi referred to "sound judgments and effective decisions" (1987, p. 151) in solving everyday problems at an advanced age. The foregoing examples presented the effects of trauma and the body's reaction to trauma (dissociation and habituation), neuro-chemical mandates, and natural aging on psychological predispositions, which appear next.

1.3) Intrinsic psychological predispositions, inborn or subsequently acquired

Many definitions of intelligence exist. For the purposes of this study of CNI, I define intelligence in a very limited way that conforms to Bateson's "a difference that makes a difference": intelligence is the measure of a person's susceptibility to change by information. This definition fits with Gardner's theory of multiple intelligences (MI). Gardner (1983; 1999) postulated a group of potential somatic barriers in his theory of multiple intrinsic intelligences that might facilitate or hinder performance of specific tasks. The intelligences currently include:

1) Verbal-linguistic - words, spoken or written;
2) Logical-mathematical - logic, abstractions, inductive and deductive reasoning, and numbers;
3) Spatial - vision and spatial judgment;
4) Bodily-kinesthetic - movement and doing;
5) Musical - rhythm, music, and hearing;
6) Interpersonal - interaction with others;
7) Intrapersonal - introspective and self-reflective capacities; and
8) Naturalistic - relating information to one's natural surroundings.

Some people have contested Gardner's theory. For example, Waterhouse cited a number of review articles that found "no validating studies for multiple intelligences" (2006b, p. 208) and other reviews stating that "MI theory lacks a

rationale for the phylogenetic emergence of the intelligences" (2006a, p. 213). However, Gardner's theory of MI has a very practical application in identifying conditions that lead to CNI. For example, a person born with a predisposition to exceptional balance (Gardner's body-kinesthetic intelligence) might not be able to use information presented in terms of mathematical concepts as readily as might the person born with a predisposition to understanding mathematical concepts (Gardner's logical-mathematical intelligence). The intelligences rarely act independently of each other, and one predisposition does not preclude another, so this example is a broad generalization for illustrative purposes only. In cases of extreme lack of predisposition toward one type of intelligence, for example, an extreme lack of logical-mathematical intelligence, a person with that lack would not be susceptible to change by information related to that lack, for instance, the numbers representing amount, price, and unit cost of various supermarket items.

In addition to those identified in Gardner's theory of multiple intelligences, other intrinsic *psychological predispositions* affect the use of information. S. M. Miller (1979b; 1979a) proposed the Miller Behavioral Style Scale (MBSS) to rank blunters (those who avoid threatening information) and monitors (those who scan the environment for threats). In 1987, she named additional points on the scale and introduced curiosity as a possible motive for high monitors' scanning the environment. If curiosity implies *volitional* use of information, the line that separates CNI from VNI occurs on the MBSS between low monitors and high monitors (see Figure 4.3).

THE MBSS,	COMPARED TO:	NONUSE OF INFORMATION
high blunters (distractors), low blunters (nondistractors), low monitors (avoiders), and high monitors (seekers), impelled by curiosity.		↑ CNI ↓ VNI

Figure 4.3: The MBSS (S. M. Miller, 1987, p. 346), as applied to this study.

Foa and Kozak (1986, referred to above, in the discussion of habituation) postulated an inherent psychological predisposition that they called a "memory structure":

> [F]ear is represented in memory structures that serve as blueprints for fear behavior, and therapy is a process by which these structures are modified. We argue that two conditions are required to reduce pathological fear: First, the fear structure must be activated, and next, information incompatible with its pathological elements must be incorporated. (p. 21)

These memory structures portray affect as a psychological *predisposition*, which is a somewhat more somatic orientation of affect than the cognitive orientation presented in Section 5.3 (Affect) below. Following Foa and Kozak's model, I postulate that CNI results from an activation of these memory structures.

Many researchers have studied the psychological predisposition labeled *"avoidant coping style."* Virtually none of these researchers has specified whether the avoidance was volitional or compelled. For example, Kalichman et al. said that:

> [P]eople who avoid health information and are generally avoidant in how they deal with stressful situations are also more vulnerable to unfounded claims and misinformation. Evaluating health information requires active deliberation that is not characteristic of people who cope through avoidance. Avoidant coping may therefore not only be unassociated with health benefits, it appears that avoidant coping may be related to a vulnerability to potentially harmful information, products, and even treatments. (2006, p. 209)

However, Kalichman et al. did not indicate the magnitude of "active deliberation" or whether avoidance of "active deliberation" would be volitional or compelled.

In addition to physical impairment and intrinsic psychological predispositions, a person's sex appears as an intrinsic somatic condition that affects CNI. For example:

> (B)oys are often assumed to be more likely than girls to engage in behavioral avoidance and withdrawal (i.e., to avoid problems by physically removing themselves from the situation) and in cognitive avoidance and denial (i.e., to not think about the problem). … However, these effects tend to be small, and it is more common to find no sex difference for both general stress … and for peer stress …. In some cases, the sex difference even favors girls. (Rose & Rudolph, 2006)

These intrinsic somatic conditions: physical impairment, psychological predispositions, and sex differences, receive extensive study, as indicated by numerous citations in the very small sample of examples in this section. These examples have documented the origins of many of these conditions leading to CNI. Other intrinsic somatic conditions that affect CNI do not have known origins, and they appear in the following section.

1.4) Intrinsic somatic conditions of unknown origin (physical or psychological), inborn or subsequently acquired, leading to amnesia and false memories

In addition to pathologies identifiable as either physical impairment or intrinsic psychological predispositions, other pathologies that cause CNI lack an identifiable cause. They include false memories and some illnesses such as those described in the *DSM-IV*. For example, an article about false memories stated:

> If there is one lesson from this research, it is probably this: Just because a memory seems detailed, just because the person seems confident in it, and just because emotion is expressed when the memory is contemplated, does not mean it really happened. (Laney & Loftus, 2005, p. 827)

Selection of a phenomenon implies rejection of the other phenomena not selected. Similarly, a person's non-volitional acceptance of information in the form of personal false memories implies the equally non-volitional (compelled) rejection of information from memories that would have been true, had the person not experienced the false memories. For example, Laney and Loftus (2005, p. 826) reported an experiment in which people who liked to eat pickles stopped eating pickles after they were convinced that pickles had made them sick in childhood (the "memory" was completely false). In other words, the people who formerly liked pickles were compelled not to use the information that pickles had never made them sick.

Narcissistic Personality Disorder (NPD), as defined in the *DSM-IV* (American Psychiatric Association, 2000), provides another example of an intrinsic somatic condition for which an origin, physical or psychologic, remains

unknown. Many researchers have documented the symptoms of NPD, however. For example:

> [N]arcissists swing between two states of mind: one of them, overt, involving disdainful grandiosity, fantasies of wealth, power, physical attractiveness, and invulnerability, and the other, covert and composed of an out-of-place sensitiveness, a sense of inferiority, insignificance and fragility, and a search for glory. Horowitz and colleagues … noted that behind their grandiosity narcissists conceal a profound feeling of shame and a proneness to feeling themselves criticized and humiliated, as a result of which they tend to reject any information that could hurt them. He also noted the presence of mixed states of mind, with a simultaneous activation of shame, anxiety, and anger, as defenses against degraded selfschemas. (Dimaggio et al., 2002, p. 423).

Mental health workers may disagree about the origins, motivations, and mechanisms of NPD, such as grandiosity, sense of inferiority, and shame. Regardless of such disagreement, NPD compels nonuse of information in two ways: NPD tends to compel a person not to empathize (not to use information about the needs of others) and not to use information that conflicts with self-image. As such, NPD qualifies as an intrinsic somatic condition that compels nonuse of information.

Summary of Section 1: Intrinsic somatic conditions

These somatic conditions (physical impairments, psychological predispositions, and conditions of unknown origin) describe intrinsic somatic barriers that contribute to CNI and on which changes in socio-environmental barriers or authoritarian controls will have little effect. For example, no amount of turning up the volume (changing an environmental barrier) will enable a deaf person to hear the radio (deafness being an intrinsic somatic barrier).

Intrinsic somatic barriers prevent use of information only in the presence of related socio-environmental barriers. For example, deafness does not compel nonuse of a newspaper, and blindness does not compel nonuse of a radio. Rather than describe each of the specific socio-environmental barriers that relate to each type of intrinsic somatic condition, I group and describe socio-environmental conditions leading to CNI separately, in the next section.

2. Socio-environmental barriers to use of information

This section describes the second of the three groups of somatic barriers to use of information (intrinsic somatic conditions, socio-environmental barriers, and authoritarian controls). This group, socio-environmental barriers, describes social and environmental conditions that compel nonuse of information. Examples of socio-environmental barriers include geographical or temporal isolation, inadequate or malfunctioning information systems, and lack of applicable economic, cultural, or social capital (resulting in prejudice based on race, physical appearance, advanced age, or gender). Socio-environmental barriers appear in the taxonomy in a category discrete from intrinsic somatic conditions and authoritarian control, because changes in socio-environmental barriers will have little effect on barriers imposed by intrinsic somatic conditions and authoritarian control, and vice versa. For example, no amount of physical proximity to newspapers or radios will enable a person to use these media to get information that an authority has banned from being communicated using these media. Similarly, if a person's television does not work, no number of televised

public service announcements will enable that person to use the information from those announcements.

2.1 & 2.2) Geographical or temporal isolation and inadequate or malfunctioning information systems

These elements appear as socio-environmental barriers in the study corpus. These barriers frequently work in concert to compel nonuse of information. For example, R. F. Miller and Tighe (1974) postulated both geographical remoteness and differences between the impaired and non-impaired communities as socio-environmental barriers to use of information by the "information poor." To overcome these two barriers, they suggested that:

> [I]f needs of the information-poor are to be adequately met, information channels must shift to nonprint media, service locations must move close to the people, and new staff competencies must be learned. (1974, p. 202)

Similarly, Owens (2006) described barriers to the use of information by members of the visually impaired community:

> Barriers include language that is too complex, text that is not accessible, lack of availability of alternative languages and formats (e.g., Braille, large print, audio and electronic formats), and use of disabling language, and the physical inaccessibility of various hard-copy formats. (p. 197)

Owens suggested that these barriers compounded the somatic barrier of visual impairment (mentioned above in Section 1.2). Nurses practicing in critical (i.e., life-threatening) situations suggested to McKnight (2006) that two environmental barriers compelled their nonuse of information--malfunctioning information systems and the unavailability of doctors:

> They [the nurses] encountered barriers to information acquisition in both paper and online systems. Equipment failure, unavailable people, social protocols, and mistakes caused by simultaneously using multiple complex systems hampered their information-seeking efforts. (p. 150)

These socio-environmental barriers (geographical isolation and inadequate or malfunctioning information systems), frequently are associated with lack of socio-economic status, as noted by R. F. Miller and Tighe (1974) above. Examples of barriers more specific to socio-economic status appear in the next section.

2.3) Lack of capital.

Lack of capital, as a socio-environmental barrier, includes lack of economic, cultural, or social capital. This study uses Bourdieu's (1986) concept and classification of "capital":

> Capital is accumulated labor (in its materialized form or its "incorporated," embodied form) which, when appropriated on a private, i.e., exclusive, basis by agents or groups of agents, enables them to appropriate social energy in the form of reified or living labor. (p. 241)

> [E]conomic capital ... may be institutionalized in the form of property rights; cultural capital .. may be institutionalized in the form of educational qualifications; and ... social capital ... may be institutionalized in the form of a title of nobility. (p. 243)

In Bourdieu's view, capital refers to a "command over resources." Those resources may be economic (based on wealth), cultural (based on knowledge of a culture), or social (based on networks of mutual acquaintance and recognition). The following examples of CNI each may involve more than one type of capital. The specific type of capital, however, does not limit the creation of a model of

CNI, because the type of capital does not differentiate any element of the taxonomy from any other element.

Nonuse of information under the circumstances of "lack of capital" can result when a source (of information) harbors prejudice about a person and withholds information because of the prejudice. Race, sex, physical appearance, advanced age, and perceptions about wealth and membership in particular communities are common bases for such prejudice.

Before continuing with a discussion of prejudice, a clarification will be useful here. Prejudice can resemble three other mechanisms: authoritarian control (described in Section 3 below), priming (described in Section 5.4 below), and avoidance of conflicting information (described in Section 6.2 below). These four mechanisms differ from each other by their sources and by the nature of the factors that might mitigate them:

- Prejudice (discussed in this section): Mirroring the viewpoint of Stubbins (mentioned above) of disability as "a particular type of relationship between impaired persons and the social and physical environment" (1988, p. 25), efforts to mitigate prejudice as a socio-economic barrier would focus on changing the *relationship*, that is, the perceived *difference* between the victim and the source of the prejudice.
- Authoritarian control (discussed further in Section 3, following): Efforts to mitigate authoritarian control (e.g., censorship) as a manifestation of prejudice (lack of capital, socio-economic barrier) would focus on changing the nature

or magnitude of the *control*, rather than the perceived *difference* between the victim and the source of the control. Both prejudice and authoritarian control, however, are somatic barriers to use of information, while the following two mechanisms are cognitive barriers.

- Priming (discussed further in Section 5.4 below) and trust / distrust of a cognitive authority (discussed further in Section 6.2 below): Priming and trust / distrust of a cognitive authority differ from prejudice and authoritarian control in that they are cognitive barriers to use of information, while prejudice and authoritarian control are somatic barriers. Efforts to mitigate these barriers (authoritarian control, priming, and trust/distrust of a cognitive authority) would require different foci and tactics. Further distinctions between priming and trust / distrust of a cognitive authority appear in Sections 5.4 and 6.2 below.

F. H. Ellis provided an example that presents the problems of discriminating among prejudice, authoritarian control, priming, and least conflict. He quotes Jonathan Swift:

> Falsehood flies, and Truth comes limping after; so that when Men come to be undeceiv'd, it is too late, the Jest is over, and the Tale has had its Effect. (1985, p. 24)

- If we define **prejudice** as "pre-judging," then Swift's "falsehood" or "jest" would compel a person to formulate a judgment before considering Swift's "truth." Mitigation of prejudice in this example would require the *person* to judge the "tale" again, taking Swift's "truth" into consideration.

- If Swift's "falsehood," came from a person or organization possessing authority, then this example would indicate element 3 of the taxonomy, **authoritarian control**. Mitigation of this authoritarian control would require the *authority* to provide less "falsehood," or more "truth."
- If the "falsehood" has become a **naïve conception** through lack of previous information that Swift would call "true," and if that naïve conception prevents consideration of subsequent information, then Swift's example demonstrates element 5.4 of the taxonomy, priming. Mitigation of this nonuse of information would require the use of "bridging analogies" (Reiner et al., 2000, p. 29) that would allow the person holding the naïve conceptions to merge "truths" with the "falsehoods" gradually, until "truths" predominated.
- If a person discredits Swift's "truth" because the "truth" conflicts with a "falsehood" based on **trust of a cognitive authority**, then this example qualifies as element 6.2 of the taxonomy, least conflict. Mitigation would require truths from stronger cognitive authorities.

Thus, Swift's statement may apply to many situations, but the determination of specific conditions leading to CNI would require knowledge of specific circumstances, such as sources and the nature of mitigating information. This concludes the clarification of the differences among prejudice, authoritarian control, priming, and least conflict, so the argument will return to the nature of prejudice.

Reports of *lack of capital* appeared in the study corpus. For example, Chute and Wiener (1996) described situations in which pilots failed to use information from flight attendants because of a difference in the cultures of the cockpit and the passenger sections of a commercial airliner.

> We described the problem as primarily arising from the fact that the two crews are drawn from two disparate cultures, one dedicated to and highly proficient in technical matters, particularly the operation of complex machinery, the other well-versed in sociability and public service. Needless to say, there is a gender difference as well: Although the number of female pilots is increasing, flying remains a male-dominated profession. The same, but opposite, can be said of the flight attendant, although male flight attendants account for a far more significant fraction of their profession than female pilots do of theirs. (p. 213)

In some examples, flight attendants were afraid to impinge on the elite "culture of the cockpit" because of a lack of social and cultural capital (the flight attendants were not conversant with the culture of the technology of flight). The resultant nonuse of information by the pilots caused accidents and near-accidents. For example,

> On March 10, 1989, 24 people were killed when an Air Ontario F-28 crashed on take-off from Dryden, Canada due to an accumulation of ice on the wings. Before the aircraft was airborne, a flight attendant, Sonia Hartwick, saw wet snow building up on the wings but thought that she should not call the cockpit because she had the feeling that pilots did not welcome operational information from cabin crew members. (Chute & Wiener, 1996, pp. 211-212)

> A passenger informed me that a piece of the wing was separating . . . . I made four visits to the pilots and was not taken seriously. Upon landing (about 20 min. later) the pilots checked it out and made a joke about not believing me. The plane was grounded and the next flight was canceled. (Chute & Wiener, 1996, pp. 216)

Similarly, McKnight (2006, p. 150, quoted above) found that social barriers (e.g., some doctors are unavailable at night to nurses) compounded the environmental barriers mentioned above to prevent nurses from acquiring information.

Xie (2007, p. 429) described prejudice against the aged as a barrier to older people's learning about computers and telecommunications from younger people: "lack of technical support is a major barrier to information technology (IT) learning, yet it is difficult to get support from younger people." Giacalone et al. (2007) noticed ageism in the prejudice of Italian doctors against older adult cancer patients:

> The communication between physicians and older patients is often thwarted by the doctors' ageist attitudes. Physicians tend to spend less time with older patients than with younger ones, paying less attention to their unexpressed needs and value preferences. (p. 365)

Menou (1983, p. 123) described societal aspects of sexism:

> [M]any traditional societies confine the woman to 'her traditional role of mother and spouse', to quote a recent pontifical statement, which left out the third basic attribute of household slave, probably because of its obvious lack of metaphysical brightness.

Other societies, perhaps less "traditional" than those described by Menou, denied various educational opportunities to women, thereby placing women in positions of less social and cultural capital. For example, Lips and Colwill (1988) described the Canadian practice of prescribing different curricula for girls and boys, leading to lower social status / capital and less pay / economic capital for girls:

> One factor that helps to stream women into traditional jobs is the existence of high school commercial courses that separate male and female students, reinforce traditional gender roles and stereotypes, and channel girls into low-paying "female" jobs. (p. 62)

These examples of lack of capital resulted in CNI through prejudice, priming, and trust / distrust of a cognitive authority.

Summary of Section 2: Socio-environmental barriers to use of information

The socio-environmental barriers described in this section consisted of geographical or temporal isolation, inadequate or malfunctioning information systems, and lack of applicable economic, cultural, or social capital. Unlike the intrinsic somatic conditions described in Section 1, socio-environmental barriers described a person's surroundings, rather than the person.

The next section, Section 3, describes another type of socio-environmental barrier unrelated to personal abilities, authoritarian control. Authoritarian control differs from socio-environmental barriers because manifestations of authoritarian control contain a degree of intentionality, as will be explained.

3. Authoritarian controls

Authoritarian controls are barriers to use of information, and changes in somatic abilities or socio-environmental conditions will have little effect in the presence of authoritarian controls. As noted above, no amount of visual acuity will enable a person to read a book burned by a censor. The Holocaust, referred to on page 1 of this dissertation, resulted from a number of manifestations of

authoritarian control of the German people by the Nazis (Lifton, 1986; Tsang, 2002).

This study derives the term "authoritarian control" from the definition of authoritarianism in the literature of sociology, usually discussed with reference to authoritarian regimes. For example:

> The major characteristics of authoritarian regimes include a limited political pluralism with restrictions on the activities of interest groups and parties, a low level of social mobilization and popular political participation, a dominantly “subject” or “parochial” political culture, and usually a personalized form of leadership. (Berg-Schlosser, 2005, p. 172)

This study, however, uses the term "authoritarian control" to refer to any situation in which one actor (governments, societies, media, religions, and individuals) denies information to another. In the study corpus, examples of authoritarian control that create CNI appear to vary in *intentionality* ("the mind’s capacity to direct itself on things," from the *Concise Routledge encyclopedia of philosophy*, 2000, p. 399). Figure 4.4 diagrams authoritarian control.

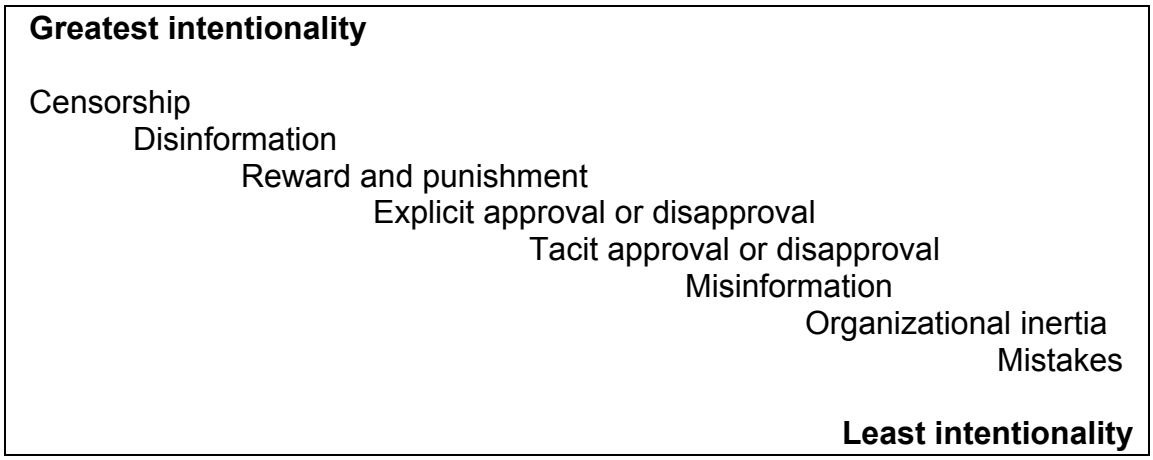

Figure 4.4: Mechanisms of authoritarian control, arranged by intentionality.

Figure 4.4 also represents the subdivisions of "authoritarian control" used in this study and the order in which they appear below.

3.1) Censorship

Censorship appeared in the study corpus in Palmer and Carter (2006) in the form of legislation known as the "United States Information and Educational Exchange Act," familiarly known as the "Smith-Mundt Act of 1948," amended in 1970, 1985, and 1999. Under this act, broadcasting or distributing to people in the U.S. the international propaganda broadcasts of the U.S. government (e.g., Voice of America and Radio Sawa) violated Federal law. In other words, the U.S. government prevented the inhabitants of the United States from hearing the information that the U.S. government provided to inhabitants of the Soviet Bloc and the Middle East. Palmer and Carter concluded that:

> It seems that an unstated reason for court decisions upholding Smith-Mundt's domestic dissemination ban against challenges based on the First Amendment and on the Freedom of Information Act may be that U.S. courts are reluctant to narrowly define the federal government's right to speak and its right not to speak. Thus, the government speech doctrine appears to be on a collision course with the right [of citizens] to send and receive information freely. (p. 32)

Such authoritarian control leading to CNI appeared in another example, smaller in geographical scope but more obviously lethal, in which South Carolina continually refused to give jurors information that would assist them in returning murder trial verdicts. According to Baarsma (2002):

> In *Shafer v. South Carolina*, the Supreme Court once again confronted South Carolina's practice of refusing to inform capital juries choosing between a sentence of life imprisonment or death that the defendant would be statutorily ineligible for parole if sentenced to a life term. (p. 23)

As a result, some South Carolina juries sentenced convicted criminals to death, thinking that death was the only sentence that would keep those criminals permanently away from society. In both of these instances, the Smith-Mundt Act and *Shafer v. South Carolina*, governments used authoritarian control to compel the nonuse of information by citizens.

Clerk (2007, p. 10) presented a less direct form of authoritarian control when she described "how oralism [a communication scheme for the hearing-impaired, taught primarily in the educational system] controlled the information provided to the deaf community in both deaf schools and deaf clubs." As mentioned above, T. Rogers (1998) suggested that a motive for this type of authoritarian control could be a desire by those in power to control or even to suppress the disabled by "defin[ing] a disability from their [the able-bodied] perspective" as a way to "have power over those with impairments." (p. 503)

3.2) Disinformation

Disinformation, the deliberate provision of incorrect information, and *misinformation*, the accidental provision of incorrect information (Rowe, 2003, p. 45, sidebar) frequently occur through manipulation of language. George Orwell (1949) coined "newspeak" for his novel *1984* to describe a fictional example of governmental disinformation through manipulation of language. Turk (2004)

described a non-fictional example, noting that the U.S. government once called some behaviors "crimes" but now calls those behaviors "terrorism":

> The United States has a long history of violence associated with political, labor, racial, religious, and other social and cultural conflicts. Assassinations, bombings, massacres, and other secretive deadly attacks have caused many thousands of casualties. Yet, few incidents have been defined as terrorism or the perpetrators as terrorists. Instead, authorities have typically ignored or downplayed the political significance of such violence, opting to portray and treat the violence as apolitical criminal acts by deranged or evil individuals, outlaws or gangsters, or “imported” agitators such as the radical Molly Maguires of Pennsylvania’s coal miners’ struggles. (p. 272)

Turk stated that the U.S. government then used the threat of terrorism to justify the killing of citizens and foreigners suspected of these behaviors:

> Among the departures from previously assumed legal norms are … (d) creation of military tribunals with the authority to try and sentence (including to capital punishment) both foreign nationals and American citizens defined as enemy combatants; (e) relaxing the prohibition of assassination to permit the extralegal killing of suspected terrorists, whether foreigners or citizens ... . The decision to launch an essentially unilateral invasion of Iraq was a huge departure from generally and increasingly accepted (outside the United States) international norms for reviewing interstate grievances and providing for a collective (Security Council) decision authorizing military action against a sovereign government. (p. 281)

Floyd and Clements (2005) analyzed six speeches in which George W. Bush used associational juxtaposition, "pairing images in order to bring about an unconscious association between them" (K. Smith et al., 2005, p. 499), incorrectly to link 9/11 to Saddam Hussein in an effort to justify the Iraq War. Fetzer (2004) described five levels of governmental misinformation and disinformation that he encountered in his investigation of the assassination of

President Kennedy. Quoted in the order presented in the article, the five levels are:

> The fifth level of disinformation occurs when a source presents information that has been deliberately selected to misrepresent, distort, or abuse the target with the intention to mislead. Citing only evidence that is favorable to one side, as though no contrary evidence exists, is known as *special pleading*. (p. 233)
>
> The fourth level of disinformation, for example, occurs, not when a work (a book or an article) is being written from scratch, but in creating a highly biased impression of a specific study by *simply ignoring* its most significant, important, or relevant features to mislead others about the contents of the work, which is another form of *special pleading*. (p. 235)
>
> The third level of disinformation occurs by abusing the man (the *ad hominem*) by attacking the author or editor of a work on irrelevant or misleading grounds that have little or nothing to do with the position the author or editor represents. (p. 236)
>
> The second level of disinformation occurs when available evidence that is relevant and therefore ought to make a difference to some conclusion, hypothesis, or conjecture under examination is simply dismissed or ignored. (p. 237)
>
> The first level of disinformation might … be characterized as apparent incompetence by someone who assumes the task of offering a critique when it is one that he is not well-positioned to provide. (p. 237)

As with other forms of CNI such as false memories (described in Section 1), these five levels of disinformation qualify as CNI because they prevent people from seeking or using information. Fetzer's five levels demonstrate authoritarian control because, according to Fetzer, people in a position of authority created conditions leading to the disinformation:

> The government has used false information to conceal, deceive, and confuse the public about the death of JFK in the past, a deception, alas!, that it continues to practice skillfully to this day. (p. 239)

3.3) Explicit and implicit authoritarian disapproval

Explicit and implicit authoritarian disapproval describes the CNI practiced by the state of Rhode Island when it prohibited the publication of liquor price information in advertisements. Ostensibly to prevent "price wars" that might encourage alcohol consumption, the state used fines and the expense of protracted litigation to punish the use of the word "WOW!" in liquor advertisements (Richards, 1997). In this example, the state explicitly disapproved of the publication of prices through fines and litigation and implicitly disapproved of the word "WOW!" by including it implicitly in the category of advertised liquor prices. The state's failure to make explicit its disapproval of the use of the word "WOW!" led to protracted litigation and eventual defeat of the state's position.

More far-reaching examples of authoritarian control occurred in Tsang (2002, p. 40), where "displacement of responsibility" allowed Germans to blame the Nazi state for the murders that Germans, Nazi and non-Nazi, committed. According to Tsang, the German government had instilled in its people a high value for obedience (an example of explicit disapproval of disobedience), granting tacit and explicit permissions for carrying out "acts of the state":

> The obscuring of causal agency can occur in displacement of responsibility, when an individual is ordered or feels compelled to perform a particular activity. Rather than blaming the self, the individual blames those who gave the orders. (p. 40)

Such orders, coupled with the promise of rewards and punishments, permitted otherwise non-murdering Germans to avoid the realization (acceptance of information) that they were responsible for murders. Referring to Bateson's

definition of information as "a difference that makes a difference," the possibility occurs that, if Germans of that era had used the information about mass murders that became available after the defeat of the Nazis, the information might have made a difference in their behavior. The fact that the Nazis went to such lengths to hide this information from the German people (Arendt, 1963; Tsang, 2002) substantiates this possibility. This example also involves the element "trust of a cognitive authority," described further in Section 6.2 below.

In a similar example of explicit and implicit authoritarian control, the U.S. government used the mass media to spread misinformation about the necessity of the Iraq War:

> [T]hose who consumed more television in the period following 9/11 exhibited greater levels of trust in the government. This trend was particularly pronounced among those who identified themselves as Republicans. This suggests that, while television coverage that promoted the Bush agenda may not have changed people's opinions in favor of the war, by presenting misinformation without an adequately critical filter television coverage reinforced trust in the government, which translated into support of the war. (Arsenault & Castells, 2006, pp. 299)

This example also involves "trust of a cognitive authority" and "least conflict," elements of the taxonomy discussed in Section 6.2 below. Arsenault and Castells implied that, in this example, the media's audience attributed cognitive authority to both the government and the media:

> Media both convey and filter the messages of the agenda-setting political agency, while keeping in mind the mood of the audience. The more these media channels conveyed rather than filtered information released by the administration, the more misinformation was channeled to the audience, thereby increasing the extent of the misperceptions held by audience members. (Arsenault & Castells, 2006, pp. 301-302)

Arsenault and Castells reported that government controls were implicit in the form of preferential news "leaks" to reporters who would write news stories that reinforced the government's rationale for initiating the war. The media benefited, too, by responding to market forces that rewarded the broadcasting of sensational material:

> [P]ressure to conform to market forces plays a key role in facilitating the close interaction between the media and politicians …. News outlets need political actors to deliver sensationalist stories that attract audiences as much as they need political decision-makers to relax regulation and conglomeratization laws. At the same time, politicians need media organizations to deliver their messages to the public in a way that activates the median voter. (p. 288)

Thus, countless American citizens supported the Iraq War through nonuse of information that refuted government claims of Iraqi support of terrorism or Iraqi possession of weapons of mass destruction. Does this action mirror that of German citizens during the Nazi era? Arsenault and Castells addressed a tangential question, the question of contemporary American versus German ability to disregard information corrections:

> In a crossnational study, they [Lewandowsky et al. (2005)] found that Americans were more likely than Germans or Australians to disregard corrections in information about the Iraq War. (p. 292)

These elements of the taxonomy (governmental misinformation and public non-acceptance of corrections) prevent information from making a difference in the continued killing of approximately 20 (Dardagan & Sloboda, 2008) to 33 (Ford, 2003) Iraqi civilians for every U.S. military death in Iraq.

Mickiewicz (2005) described another mechanism of authoritarian control that occurred in Russia and in the U.S., media "framing" or "priming" (described more fully in Section 5.4 below). Mickiewicz quotes Entman (2004, p. 5) in defining priming: "selecting and highlighting some facets of events or issues, and making connections among them so as to promote a particular interpretation, evaluation and/or solution." In Russia, 70 years of authoritarian (Soviet) control of the media prepared the citizenry to evaluate news skeptically. "Priming" by the media simply did not work in Russia because many citizens expected it and greeted it with well-developed skepticism. In America, however, perpetual governmental framing created "a world that sets a low bar for citizen competence" (2005, p. 355). Mickiewicz quoted Graber, who said:

> In the vast majority of political news stories, framing does not match the manner in which ordinary Americans tend to store such information, making matching difficult or impossible. Stories tend to be overloaded with facts and figures and names, which are search cues that most people fail to store. ... For example, journalists often refer to pending congressional legislation only by the name of a particular bill or by its expected price tag. They give little substantive identifying information …. Audiences then find it difficult to process the information and may therefore abandon the effort--which means that incompatible framing has prevented learning. ... Incompatible framing of questions may prevent retrieval of information that is actually present in memory. (Graber, 2001, p. 26-27)

The phenomena described by Graber represent a number of elements of the taxonomy: lack of threshold knowledge (described further in Section 4), avoidance of cognitive overload and perceived cost exceeding perceived benefit (both described further in Section 6.1), and avoidance of conflicting information (described further in Section 6.2). Yet, this example by Mickiewicz and Graber

qualifies as authoritarian control because governments and media employ these elements in a manner that apparently is deliberate.

Seife (2001, p. 1474) illustrated the power of an authority, the Vatican's Pontifical Academy of Sciences, to control the use of information by others. For example, the Vatican appears to have *decreased* CNI through explicit approval of recombinant DNA technology:

> "There was a great deal of alarm at the time whether it was appropriate to use," says Alexander Rich, a biophysicist at the Massachusetts Institute of Technology. But [Pontifical Academy] members, including [David] Baltimore, drafted a statement supporting the use of recombinant DNA. The pope followed with his own statement giving the nod to genetic research. "Some said, 'Let's not unleash this technology at all,' " says Sheldon Krimsky, a science policy scholar at Tufts University in Medford, Massachusetts, and a nonmember of the academy. "The Vatican's position on [recombinant DNA] helped to blunt ideological opposition to the use of recombinant DNA technology."

Seife also described Pontifical Academy studies that *increased* CNI. In the radiocarbon dating of the Shroud of Turin, the Vatican dictated to the Academy a methodological protocol that returned an ambiguous provenance for the shroud. In this example of authoritarian control, CNI resulted from "trust of a cognitive authority" (described further in Section 6.2) and "explicit reward," because the Vatican funded the study. Seife explained the explicit reward:

> In return, the scientists get the ear of one of the most important people in the world--and, through him, a chance to influence whether people accept or reject new knowledge and technology.

As quoted earlier, Arsenault and Castells (2006, pp. 299) demonstrated that "those who consumed more television in the period following 9/11 exhibited greater levels of trust in the government." In other words, trust in television

mirrored trust in the government. Television and government became authoritative sources of information. When the government used the media to disseminate misinformation, both the government and the media were exercising authoritarian control by reducing television viewers' access to other information.

Hoffmann (2004, p. 77) postulated a model for this reduction of information. He suggested that two worlds existed: a world deliberately "mediated" by media and a world unmediated by media. He compiled a list of six values, defining "values" as "constructions that are shaped by world views and paradigms both in broader American society, and within the media industry." His list, quoted here verbatim, included:

1) Consumerism and materialism. Success often is measured by what we own, where we live, what kind of car we drive or what clothes we wear in the mediated world.

2) Patriotism. The United States' way of life--freedom, free market economy, etc.--is the best in the world. This value has been conveyed even stronger since the Sept. 11, 2001, terrorist attack. Conversely, those who disagree with our way of life are considered the enemy, evil-doers, oppressors, etc.

3) Physical attractiveness is very important. This value begins in teen magazines and other media geared at young people, especially female young people. It is carried on through adult media.

4) Information must be entertaining. That means it must be relatively easy to understand--dumbed down in some of our opinions--fast-paced, delivered by those physically attractive people mentioned a paragraph earlier.

5) Individualism. You can be successful if you act aggressively and take on the world yourself. Work hard, compete, be tough. After all, it's you against the world.

6) The natural world primarily provides resources for humans--fuel, food, materials for shelter, recreation, etc. (Hoffmann, 2004, p. 77)

These values, then, compelled people to avoid information from the "unmediated" world through a variety of CNI mechanisms. For example, repeated viewing of messages promoting personal wealth and physical beauty (Values 1 and 3) appears to lead a viewer to reject values promoting inner worth, through "least conflict," described in Section 6.2 below. Repeated exposure to Hoffmann's Value 4 resembles "entertainment over information," described in Section 6.1 below. Value 6 resembles Narcissistic Personality Disorder, described in Section 1 above.

Hoffmann suggested that mass media *implemented* these six values by creating a mediated world. Some of the six values, however, appeared to have *originated* in other sources, sources that used the media to convey the values to viewers. For example, Hoffmann's Values 2 and 5, "patriotism" and "individualism," appear to parallel the political interests of the United States government, because Hoffmann noted that these two values became "stronger since the Sept. 11, 2001, terrorist attack" (2004, p. 77), with dissenters portrayed as evil and as enemies. Hoffmann's "consumerism and materialism," "physical attractiveness," and view of the "natural world" values appear to parallel the financial interests of the U.S. mercantile sector, such as the producers and distributors of consumer goods. Similarly, Hoffmann suggested no specific source for the "information as entertainment" value (described further in Section 6.1 below), but he portrayed this value as a deliberate appeal by the mass media

to the less thoughtful or less educated portion of society through his use of phrases such as "dumbed down" (2004, p. 77).

Arsenault and Castells (2006, p. 289) expressed a more venal view of media manipulation of society (quoting Kellner, 2005, p. 37):

> [I]t is in mainstream media's best interest to adopt the Bush administration's frame of fear in order to keep Americans in a "constant state of alert, with their eyes fixed on media screens, thus increasing corporate profits."

Hemsley-Brown and Sharp (2003) described a more specific example of a local, "institutionalized culture" influencing nonuse of information by exerting authoritarian control:

> Louis suggests that all knowledge is local and knowledge created elsewhere must be compatible with existing belief structures so that it becomes legitimised and has utility within the local setting. She suggests that research knowledge generated in universities or research institutes is only one source of knowing and that its use must be negotiated through the dissemination process. … Louis concludes that the main barriers to knowledge use in the public sector are not at the level of individual resistance but lie in an institutionalised culture that does not foster learning. (p. 459)

Hemsley-Brown and Sharp described in this example an authoritarian culture that did not encourage learning. In this example, lack of encouragement to learn prevented nurses from using information derived from new research. The account does not indicate whether this lack of support was explicit or tacit, or whether it was a result of organizational inertia, or simply a mistake. Regardless of the intentionality of the authoritarian behavior, however, the example describes authoritarian control leading to CNI.

Hooper (2007, p. 14) reported the analysis by the Union of Concerned Scientists about ExxonMobil sponsorship of studies denying global warming (e.g., "carbon dioxide emissions posed no warming threat," p. 14) and likened the sponsorship to tobacco industry practices denying a connection between smoking and cancer. In such examples of disinformation, the incorrect information (denial of global warming; smoking is unconnected to cancer) compelled the nonuse of correct information in two ways. First, the effective doubling of the messages about global warming (it exists; it does not exist) and the complexity of the issue can compel nonuse of information through avoidance of information overload (described in Section 6.1 below). Second, the introduction of conflicting messages can result in schema conflict (described in Section 6.2 below). Regardless of the CNI mechanism employed, this example qualifies as authoritarian control, because it reports deliberate dissemination of disinformation: "ExxonMobil, for example, spent some $16 million between 1998 and 2005 … funding 43 bodies critical of claims of climate change." (p. 14)

Summary of Section 3: Authoritarian controls

The foregoing examples invoke the techniques of authoritarian control described by Foucault, from the somatic to the cognitive, and from the overt to the covert. As mentioned before, "A stupid despot may constrain his slaves with iron chains; but a true politician binds them even more strongly by the chain of their own ideas" (1977, p. 102). Authoritarian barriers continue to be predominantly somatic CNI, however, even though they may use cognitive

methods. The next several sections describe cognitive barriers to use of information. As noted in Section 3, Foucault's true politicians employ a number of these cognitive barriers to constrain their constituents.

Cognitive barriers to use of information

Cognitive barriers control a person's cognition. The following facets of CNI mark a movement from somatic involvement to cognitive, even though that cognition is pre-cognition or intuitive or "instant" cognition, rather than deductive or inductive cognition (cf. Figure 1.4: The continuum of cognition). In other words, the following elements of the taxonomy may or may not rise above a threshold of awareness, but they do NOT involve conscious deduction or induction. Conditions that involve deductive or inductive cognition and result in nonuse of information become volitional nonuse of information (VNI), which is beyond the scope of this study. The following conditions that lead to CNI also represent a cognitive "lack of pull" from a person, as explained in the introduction to this chapter, rather than the "push" that somatic barriers represent (cf. the bell jar analogy depicted in Figure 4.1). Cognitive barriers clustered in three broad categories, outlined in Figure 4.5 and described below.

Cognitive barriers to use of information

4 Threshold knowledge shortfall

5 Attention shortfall

6 Information filtering

Figure 4.5: Cognitive barriers that cause CNI.

4. Threshold knowledge shortfall

"Threshold knowledge shortfall" derives its name from an analogous term in chemistry: threshold energy, or activation energy. In 1889, noted Swedish scientist Svante Arrhenius formulated the concept of threshold energy to explain the energy barrier that must be overcome before two molecules can react with each other. In other words, a specific level of energy (heat and/or pressure) must be present for one molecule to make a difference in another molecule, and this level varies depending on the types of molecules. Analogously, a priori information must exist in a person as knowledge before new information can make a difference in that person's behavior, and the type and amount of knowledge required depends on the nature of the new information. For example, no amount of a priori knowledge about reading Turkish will help a person to read a newspaper written in Chinese, whereas an a priori knowledge of Chinese ideographs will permit the information in a Chinese newspaper to make a difference in a person's behavior. The following section presents a series of conditions, one building upon the other, that can compel nonuse of information.

This series of conditions begins with literacy / illiteracy and adds additional barriers such as mutually unintelligible languages, dialectal and idiomatic differences, use of euphemisms, lack of extra-lexical information, and lack of awareness of the availability of information.

Menou (1983, p. 123) described illiteracy as something of a geographical phenomenon, with peoples of the "south" more likely to not read or occasionally not to possess an alphabet. However, CNI can persist in the presence of literacy. McKnight (2006, p, 149) described the problems of literate nurses:

> The nurses encountered barriers to information acquisition in both manual and computer systems. The most common problem in manual systems was illegible handwriting. Electronic records systems eliminated the difficulties of handwriting interpretation. However, navigability of electronic systems presented another set of barriers to finding information.

Presumably, the creators of those manual and electronic information sources could use the information in those sources because the creators would be familiar with their own handwriting and navigation conventions. Volk (2007) noted that most medical patients and their families did not possess the abilities that allow librarians to use systems that locate information:

> It seems that, despite the penetration of the Internet in society, other barriers may prevent patients and families from accessing relevant information when they need it. ... The data suggest that the librarian's specialized skill set and knowledge of the principles of information organization and retrieval are essential to locating information on the vast Internet. (p. 203)

Ikpeze and Boyd (2007, p. 645) implied that lack of experience prevented novice users of information systems from navigating electronic systems:

> It is unlikely that many students who use the Internet possess adequate skills and strategies to efficiently and effectively negotiate the realms of available information to learn new content knowledge.

R. J. Lewis et al. (1986) noted that information derived from prior experience enhanced remembering of sexual facts:

> As expected, subjects who were more experienced sexually made fewer errors when recalling material from the sexual vignettes than did those who were less experienced. Thus, it would appear that these sexually experienced subjects ... appear to be fairly adept at processing information that is relevant to their area of relative "expertise." ... In short, the experienced subjects had cognitive as well as behavioral experience in the area of sexuality, which presumably led to the development of more complex sexual schemas [sic]. These schemas, in turn, enabled them to process the sexual information more efficiently. (pp. 487-688)

CNI can persist, even if a person is literate, familiar with handwriting conventions, skills and strategies for using electronic systems, and possesses experience. Black (1983, p. 307) described threshold knowledge barriers with reference to mutually unintelligible languages, saying specifically: "the language barrier has been one of the most significant problems in information transfer." For example, if a person has never learned to read Turkish, that person will be compelled not to use the lexical content of books, magazines, and newspapers written in Turkish. Yet, even with literacy, familiarity with handwriting conventions, skills and strategies for using electronic systems, experience, and a mutually intelligible language, CNI can persist because of dialectal and idiomatic language. For example, Muha and Smith (1998, p. 118) noted that, in relation to cancer patients seeking information:

> The data in this survey emphasize the point that … information providers should consider that many health information seekers may lack a basic

> understanding of human biology and anatomy and may not be familiar with technical terms and concepts.

Giacalone et al. (2007, p. 369) studied one segment of the cancer patient population and found that:

> [O]lder patients believe their low level of education limits their knowledge and understanding of medicine (55.7% of the enrolled elderly patients had none or a low education). The incapacity of understanding medical language is also a limiting factor for the information seeking behaviour.

Chute and Wiener (1996, p. 223) addressed the lack of knowledge of aircraft terminology and aeronautical information among flight attendants:

> Katherine Say (deceased flight attendant) may have been under the impression that the F-28 was equipped with ground de-icers, which it was not …. The Board of Inquiry cited this as an example of the need for joint training with the cockpit crew in order to educate cabin crews [flight attendants] on the hazards of take-off with contaminated wings and on proper de-icing procedures.

In this example, the lack of a priori information about the absence of ground de-icers apparently compelled flight attendant Say to not use information about ice on the aircraft's wings. In other words, the stimulus (observation of ice on the aircraft's wings) did not make a difference in flight attendant Say's response (informing the pilot about the ice). The lack of threshold knowledge about ground de-icers compelled flight attendant Say not to use information about ice on the aircraft's wings. Quoting Chute and Wiener again:

> We have discussed the problems created by the flight attendants' relative lack of knowledge of aircraft terminology. We have also advised against the blind trust that flight attendants place in pilots' abilities. We recommend that research be conducted to determine just what aeronautical information flight attendants need to communicate safety critical information to the cockpit and that this become part of their training. (p. 228)

Thus, lack of threshold knowledge in the form of specialized vocabularies can compel even literate, skilled people to not use information.

CNI also can occur as a lack of *enough* of a language. For example, Zulu (2003) described students who spoke English but did not speak it well enough to attend special instruction classes designed to improve their knowledge of English:

> It is a catch-22: students don't attend sessions because they feel alienated by their lack of knowledge, but the knowledge gap can only be closed by attending and participating in sessions. (p. 59)

Given fluency in a language and its dialect and idioms, semantic differences still can cause CNI, as when the Nazis created and used euphemistic language. For instance, the Nazis allegedly termed death camps "charitable foundations for institutional care." Some German citizens of that time could not accept information about the lethal purpose of the camps identified as charitable foundations (Arendt, 1963, p. 109; as cited by Tsang, 2002, p. 40), whereas those whose CNI had been mitigated by sufficient additional information, such as information about the lethal purpose of the camps or information about Nazi terminology, could.

The previous paragraphs have described lack of threshold knowledge caused by illiteracy, unfamiliarity with handwriting conventions, lack of skills and strategies for using electronic information systems, inexperience, language differences, lack of enough of a language, and euphemistic use of language. Beyond these situations lies the threshold of extra-lexical information. L. M.

Meyer (2000) gave examples of lack of threshold knowledge as a barrier to second language acquisition as it affected the student and the teacher:

> How would teachers act out the word "water"? Would they turn on an imaginary faucet, then pretend to fill and drink from a glass? Would they display a glass of water and point out the wet, transparent liquid inside? What would these actions mean to the child who recalls cranking water from the village well or lugging it from the river in a plastic bucket? Or to the child who honors water ritually as a sacred element of the natural world? How could the teacher's translation of the word "water" into *agua* or *yacu* or *tikui* or *nduta* bring to life the intended meanings if this word in the child's home language triggers the scenes and uses of the word within the child's cultural experience, not the teacher's? (p. 230)

In this example, the teacher's lack of a priori extra-lexical knowledge (the cultural context of "water") might compel the teacher not to use (i.e., not explain to the student) the correct information to describe "water." This behavior then would compel the student not to use (i.e., not to adopt) the meaning of "water" that is appropriate to the learning situation. Lack of extra-lexical information appeared in the study corpus also in other forms. Godlee et al. (2004) named a number of extra-lexical conditions leading to CNI:

> Known and assumed barriers to using information in practice (many of which are also experienced by health professionals in developed countries) include: lack of awareness of what is available; lack of relevance of available information (not meeting people’s needs in terms of scope, style, language, or format); lack of time and incentives to use information; and lack of interpretation skills. (p. 298)

Godlee's "lack of awareness of what is available" is one of the most profound lacks of threshold knowledge. For example, if a person is not aware of the availability of specific information, that person will lack motivation to seek that information.

Summary of Section 4: Threshold knowledge shortfall

This section demonstrated that a lack of threshold knowledge can prevent information from making a difference, as Bateson put it, much as a lack of threshold energy can prevent one molecule from reacting with another. Examples of lack of threshold knowledge included illiteracy, unfamiliar handwriting and electronic information systems, lack of skills and experience, mutually unintelligible languages, dialectal and idiomatic usages, lack of extra-lexical information, and lack of awareness of the availability of information. Each of these examples compels nonuse of information.

In addition to shortfalls in threshold knowledge, CNI can result from another group of shortfalls. The next section describes them under the umbrella term "attention shortfall."

5. Attention shortfall

For the purposes of this study, attention is the focusing of cognition on a phenomenon. Attention shortfall, then, would be the lack or loss of that focus. Types of attention shortfalls cluster into four sub-categories, outlined in Figure 4.6 and described below.

5 Attention shortfall, caused by:
- 5.1 Engrossment
- 5.2 Distraction
- 5.3 Affect: emotion or mood
- 5.4 Priming

Figure 4.6: Attention shortfalls that lead to CNI.

5.1 Engrossment

Engrossment is a mental state involving the engagement of attention by a task to the exclusion of attention to other information. Csikszentmihalyi (1990) referred to engrossment in creative efforts as *flow*. Reed and Schallert (1993) referred to engrossment among students as *involvement*. Jacobson (2001) referred to engrossment in the imagined/imaginary/virtual worlds of computer-assisted communications as *presence*. Engrossment also appeared in the psychology of dysphoria as *rumination* (clinging to negative thoughts and feelings: see Broderick, 2005, p. 502; Hofmann et al., 2005, p. 465). When rumination appears as a symptom of clinical depression, it interferes with a mechanism underlying memory retrieval: executive control ("the process by which the mind programs itself," Logan, 2004, p. 227). Reduced executive control then results in CNI. As Williams et al. (2007, p. 143) express this process of reduced executive control:

> [E]ach of these two factors, avoidance and capture/rumination, interacts with impairment [clinical depression] in a third major mechanism underlying memory retrieval: executive control. Reduced executive control results in a failure to inhibit competing information. The result is a greater likelihood of retrieval being “hijacked” by task-irrelevant material.

Riskind et al. (2006, p. 786) postulated an engrossment similar to rumination, which they called a *looming cognitive style* or *worry*:

> Additionally, worry, as well as more abstract meta–cognitive activities such as meta–worry (i.e., worry about the degree to which one is worrying; Wells, 1995) can absorb so much of the vulnerable person's mental capacity that these activities may reduce the amount of attention that the person can allocate to managing frightening mental representations. In some cases, events can be moving so quickly that worry and meta–worry cannot provide adaptive, short–term coping options that serve to lessen, or transform, mental representations of rapidly intensifying danger. Once this threshold is reached, the individual is likely to engage in wishful thinking or thought suppression as the primary avoidance strategy.

In other words, engrossment via looming cognitive style can occupy attention to the exclusion of non-threatening information, compelling nonuse of that non-threatening information. Conversely, the looming cognitive style not only can *increase* CNI by decreasing use of the non-threatening information, it also can *decrease* CNI under other conditions. According to Riskind et al.:

> The subjective sense of looming vulnerability is proposed to elicit anxiety, sensitize the individual to signs of movement and threat, bias cognitive processing, and impede habituation to threat stimuli. (p. 779)

Habituation itself is a CNI (described in Section 1 above), so that, when engrossment via looming cognitive style impedes habituation, it decreases CNI. *Meta–worry* (worry about worry, Wells, 2005, p. 108) also appeared in the study corpus and functions as another form of engrossment, in that it occupies attention to the exclusion of non-threatening information.

5.2 Distraction

Distraction resembles *engrossment*, but a subtle difference in timing differentiates distraction from engrossment. *Engrossment* in one task prevents the *inception* of another task, but *distraction interrupts* a task already underway. For example, the airline catastrophe described on page 1 of this dissertation occurred because the pilot, first officer, and air traffic controller were distracted from critical take-off duties by less-important tasks and by talk about personal matters (National Transportation Safety Board, 2006).

McKnight (2006, p. 150) reported the effect of interruptions on nurses:

> Someone who was interacting with one information system (human, paper, or automated) might be interrupted with another and not complete the task begun in the first system. (p. 149)

Radeborg et al. (1999, p. 776) determined that the number of automobile traffic accidents increased when drivers engaged in telephone conversation.

> A driver engaged in a demanding conversation is faced with two attentional problems: (1) mustering of sufficient attentional resources, and (2) allocating the available attentional resources in an optimal way to the two tasks. In previous studies of mobile telephone use while driving, the question of traffic safety, namely how driving is affected by the simultaneous use of a telephone, has generally been central. The conclusions reached in such studies have varied somewhat, although the results have basically indicated that telephone use enhances the risk of traffic accidents, at least when it is concurrent with other activities that place demands on the drivers' attention. (p. 776)

In a less life-threatening but no less important situation, Tyree and T. A. Fiore (1994) suggested that a textbook's content should "avoid 'seductive details'--trivial or unimportant points that may heighten interest to the point of distraction

from important content" (p. 370). Situations of extreme distraction resemble overload, described in Section 6.2 below.

5.3 Affect

Affect appears as *emotion* or *mood*, with emotion being a shorter phenomenon than mood (Beedie et al., 2005, pp. 864-865 & 868-869).

> In the literature, it is frequently argued that, whereas emotions are acute and phasic episodes, moods, which are sustained and enduring, are ever present and we are constantly in a mood of one sort or other. (p. 869)

Affect compels nonuse of information in a manner similar to engrossment (described above in Section 5.1) and distraction (described above in Section 5.2) in that affect can interrupt or forestall use of information. Affect appears in the taxonomy as an element separate from engrossment and distraction, however, because it describes phenomena not required for engrossment or distraction (namely, emotion and mood), and because it does not necessarily lead to engrossment or distraction.

Affect can cause selective attention or selective memory in a wide variety of circumstances, leading to CNI. Many of these circumstances appear to involve CNI as a response to threat: threat to life, threat to health, or threat to a person's ego. The sequence of events from presence of information to CNI appears in graphic form in Figure 4.7.

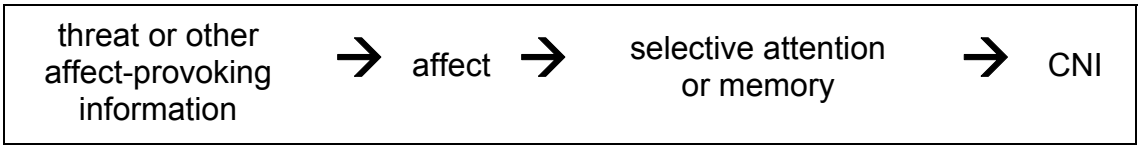

Figure 4.7: The role of affect in CNI.

The following examples discuss five facets of affect, outlined in Figure 4.8 and explained below.

5 Attention shortfall
5.3 Affect
a CNI as a reaction to a threat to life
b CNI as a reaction to a threat to health
c CNI as a reaction to a threat to self-image or ego
d CNI as a reaction to the unknown
e Factors compounding the effect of threat on CNI

Figure 4.8: Five facets of attention shortfall caused by affect.

Threat to life

Terror Management Theory (TMT, cf. Mikulincer et al., 2003, p. 20) postulates that self-preservation, when coupled with awareness of mortality, creates intolerable feelings of helplessness and terror. To tolerate these feelings of helplessness and terror, humans suppress thoughts about death, treat death as a distant problem, adopt a worldview that denies death, or enhance self-esteem. Enhancing self-esteem perhaps helps a person to believe that others will remember the person after the person's death, granting the person's memory a sort of immortality. Information about one's own death is, in many situations, the

most affective and affecting information that a person can use or not use. In other words, information about one's own death can make a larger difference in one's own behavior than can other kinds of information. For the purposes of this study, I generalize information about death to include "bad" news, where "bad" news is information that results in negative affect. For example, Deveney (2004) described the aversion among clinically non-depressed people to "negative" (i.e., threatening) faces:

> [T]he physiological bias in the nondepressed controls appeared not to be the result of an enhancement of positive stimuli processing in the controls, but rather an avoidance of elaborative processing of negative stimuli in the controls (Deldin et al., 2000). These results suggest that the enhanced recognition of positive faces as compared with negative faces observed in several behavioral studies (e.g., Ridout et al., 2003) may be due to the decreased elaboration of negative faces relative to positive faces during working memory.

In other words, threatening faces provoked reduced processing of information and a resultant CNI.

Fear of death-reminders

Fear of death-reminders might explain the phenomenon reported by Scott and Stradling (1997), in which sufferers of Posttraumatic Stress Disorder (PTSD) frequently rejected PTSD habituation therapy that relied on reliving the traumatic event:

> Clients seen in clinical practice seem likely to benefit from exposure treatments if they find them acceptable, but many do not. Data … suggest those with more severe symptoms and those with higher levels of co-morbid depression may be the clients least likely to tolerate exposure treatments. (p. 526)

Giacalone et al. (2007, p. 369) reported that elderly patients:

> [H]ave a pessimistic point of view as to the meaning of a cancer diagnosis and the likelihood of survival. … Sources of further information were not referred to by one third of the elderly patients (43/122) but only by 2 [of 52] young patients ($p<0.0001$).

Fear of death-reminders appeared to correlate to advanced age in the Giacalone et al. study, suggesting an outdated view of cancer. In other words, a lack of threshold knowledge about advances in cancer research may have contributed to fear of death-reminders and compelled nonuse of information.

Weisgerber (2004, p. 561) described a medical condition known as sleep paralysis (SP). She suggested that the abject terror accompanying the condition might account for the sufferer's nonuse of the well-defined medical explanation, hypnagogic hallucination (a distortion in a person's perception of reality, typically accompanied by a powerful sense of reality, occurring between wakefulness and sleep):

> Many … drew on their religious background and religious beliefs in an effort to make sense of the unusual phenomena they experienced during SP attacks. Since SP is frequently characterized by a sensed evil presence and hypnagogic hallucinations in the form of a dark shadowy figure or an intruder …, SP victims often linked the intruder figure to the devil. [P]aranormal constructions of SP [were] linked to accounts of out-of-body experiences (OBEs) and related beliefs in astral projection and contact with the spiritual world. It was a widely shared view … that SP can result in OBEs or lucid dreams if the person experiencing the paralysis stops fighting it and relaxes instead….

The attribution of SP to devils, astral projection, or contact with the spirit world has several affective components. I conclude that attributing SP to external (and therefore uncontrollable) devils both relieves the sufferer of personal

responsibility for the frightening episode and denies the finality of death. For example: "If devils exist, gods must exist; if gods exist, an afterlife must exist, and I will not really die." Attributing SP to paranormal phenomena such as astral projection or contact with the spirit world reassures the sufferer about the existence of an afterlife and also increases self-esteem through social prominence among other believers, for example: "I have seen the other side, it does exist, and I am its messenger, so respect me."

Threat to health

Threats to health, while not as extreme as threats to life, also invoke affective mechanisms that result in CNI. Brunel and Pichon (2004, p. 366, 368-369) described the strategies and provided the quotations listed here, strategies by which people justified to themselves their eating of food that could be "a risk to their health" (p. 360):

Behavioural disconnection: "I keep turning the packet so as to find out what the ingredients are, this infuriates me, but I keep eating because they are so good." [This behavior compels nonuse of information from the ingredients label.]

Denial: "from a statistical point of view, one has such a small chance of becoming ill, that it is perhaps disproportionate to the seriousness of the potential malady." [This behavior compels nonuse of information about the nature of statistical medical risk, for example, that if a condition kills one in 100,000 Americans every year, then that condition *will kill* about 3,000 Americans in a year.]

Fatalism: "I am a fatalist, I think that one is perhaps already blasé, one eats so many unhealthy things, in any case, that it is just one more among others." [This behavior compels nonuse of information about the fundamental principles of mathematical probability and about the additive and cumulative threat to health of eating unhealthy foods.]

Cognitive repression: "when I buy a product I don't do it according to a plan. If I made a plan by saying to myself: take care, if I buy this product such and such a thing might happen to me, I would probably not buy it. So I prefer not to think about it and buy the product anyway." [This behavior compels nonuse of information about the "thing" that "might happen."]

Magic thought: "The body has been conceived to fight against all sorts of exterior aggressions. The body is, in any case, resistant to lots of things." [This behavior compels nonuse of information about the body, i.e., that bodies do *not* resist "lots of things," as the obituary column in any newspaper will substantiate.]

Confidence in the producer: "I buy fresh pork sausages at the butchers, I don't eat those packaged in a supermarket." [This behavior compels nonuse of information about any similarities that might exist between the meat processing industry that terminates in the butcher shop and the meat processing industry that terminates in a supermarket.]

Confidence in the retailer: "If he is a butcher I am confident that I can leave him to make the choice, rather than imposing my own choice." [This behavior compels nonuse of information about the expertise and motivations of the retailer, information that might undermine the consumer's confidence.]

Confidence in the state: "This class of risk reducers includes official signs of quality, traceability and precautionary principles." [This behavior compels nonuse of information about the expertise and motivations of the state, information that might undermine the consumer's confidence.]

Confidence in associations: "Interviewee 23 sometimes buys food that is 'stamped, product elected as product of the year'." [This behavior compels nonuse of information about the expertise and motivations of the association and information about the merits of the product, itself, information that might undermine the consumer's confidence.]

These strategies compelled people to avoid information that might create fear about the health risks of the food they were eating.

Studies of breast cancer treatment have revealed multiple elements of the taxonomy that result in women refusing information about the condition. Kreling et al. (2006, p. 1069) described women for whom:

> [A]nxiety interfered with their ability to read materials. Some women said they found the information frightening and disturbing. One woman had a

> lengthy conversation with her doctor who then told her to get Dr Susan Love's Breast Cancer Book [sic]. She said, 'One of my daughters went out and got (Susan Love's Breast Cancer Book) for me and I couldn't read it. It burned my hands. I couldn't read it. You know? I couldn't, it upset me a lot. (p. 1069)

Other studies have reported influences that exacerbate the effect of health threat on CNI. For example, Azaiza and Cohen (2006, p. 528) described cultural and religious barriers to acquisition of information about breast cancer:

> [T]he difference between the Christian women and the Muslim and Druze women in barriers concerning feelings of discomfort and embarrassment and the belief in no cure in the case of a positive result may be understood in light of traditional cultural and religious beliefs. In addition, modesty is rigorously maintained by women of traditional Arab society. … Level of religiosity accounted for low attendance at CBE [clinical breast exam] screening but had no significant effect on mammography screening. CBE involves an invasion of a woman's privacy and is usually performed by a male physician (unlike mammography, usually administered by female technicians). CBE thus causes greater feelings of embarrassment, which might explain why religious women avoid it more than mammography.

Such cultural and religious barriers to use of information exacerbate the "threat to health" element of the taxonomy through a "belief in no cure," as reported above. The barriers also illustrate the "least conflict" group of elements described in Section 6.2 below.

Volk (2007) cited a number of barriers that compelled patients not to seek medical information, including unspecified affect:

> Seven users described specific mental or physical barriers that prevented them from doing research on their own, such as not having an Internet connection at home, not feeling well enough to do their own research, or just lacking the time. These comments suggest that the extra stress brought on by a diagnosis such as cancer may be a barrier to information seeking. (p. 205)

This section has presented documentation of threats to life and threats to health that appeared in the study corpus. Both types of threats resulted in selective attention or memory, leading to compelled nonuse of information.

Threat to ego

The study corpus contained examples of element 5.3.3 of the taxonomy, *threat to ego*, and these examples portrayed *threat to ego* as a threat just as intense as a threat to life or health. Examples in the corpus presented several different aspects of ego, such as a person's *self-image*, *another's image* of that person, and *attribution theory*. The next several sections describe these aspects of ego and the ways in which threats to these aspects affect nonuse of information.

Self-image is an aspect of a person's ego that can affect the way the person accepts health messages. Sherman et al. (2000, p. 1057) suggested bolstering the self-images of people to increase their acceptance of information that might affect their self-images, somewhat like administering sugar with medicine:

> Because people smoke or drink or have sex with self-image concerns at stake, it is important to consider the role of these behaviors in the individual's self-image. If these acts are relevant to the person, then this article offers an alternative to putting the person's self-image at stake; with the self-image bolstered by other means [e.g., encouraging college students to reflect on their central values], the health message can become less threatening to the person, and the person, more accepting of the health message.

Moradi et al. (2006, p. 58) presented a hypothesis to explain why information that conflicts with self-image can generate affect, selective attention, and CNI:

> Situations are threatening to the extent that they are perceived to have the power to change one's core constructs, such as the self, in profound and intolerable ways. For example, a person who construes herself or himself as good, kind, and warm might feel threatened by being told that she or he is cruel because the notion of the self as cruel would fundamentally transform the person's self-concept in an undesirable manner. When faced with threatening material, … persons distance themselves from and reject the material completely and seek validation and reaffirmation of their original construal. … (i.e., "Cruelty is bad. I despise cruelty; therefore, I am good"). As such, expressing rejection of the threatening material serves to validate the initial construction of the self and reaffirm the self as good.

In other words, information that conflicts with self-image will threaten a person's core constructs with intolerable change. If Sherman and Moradi are correct, the larger the change in self-image, the greater the degree of bolstering that will be required to effect the change.

Articles in the study corpus suggested two classifications of ego-threatening messages: "negative face" versus "positive face" and shame versus embarrassment. Brown and Levinson (1978, p. 67): explained "negative face" as "the want of every 'competent adult member' [of society] that his actions be unimpeded by others." In other words, negative face is the expectation to be autonomous and left alone. In extreme examples, negative face becomes resignation, described further in Section 6.1. Brown and Levinson (1978, p. 67) explained "positive face" as "the want of every member that his wants be desirable to at least some others." In other words, positive face is a desire for a positive image of the self as held by other people. Goldsmith (1999) investigated

ways to avoid threats to an advice recipient's positive and negative face in a counseling situation, because threat to the advice recipient's face could cause negative affect, leading to selective attention and nonuse of the advice.

Another method of classifying ego-threatening information (after M. Lewis, 2001) categorizes threat by its affective reaction: as embarrassment (negative affect resulting from public attention) or shame (negative affect resulting from a change in self-image). Zulu (2003, p. 59) described embarrassment as a result of peer intimidation in second language acquisition:

> [T]he students reported that they did not attend SI [Supplemental Instruction] regularly because they did not understand the concepts discussed in the sessions …. Moreover, they reported feeling intimidated by their peers whose preparation was stronger.

Dore (1994) reported shame resulting from "a lifetime of subtle and not-so-subtle inferences of personal inadequacy," resulting in a lowering of self-image that created anxiety and nonuse of information in educational settings. Specifically, Dore described:

> [T]he intuitive/affective barrier, [which] is aroused by anxiety concerning personal mastery and prevents the absorption of new material. According to Dunn, women may be particularly vulnerable to this learning barrier because of a lifetime of subtle and not-so-subtle inferences of personal inadequacy in educational settings. (Dunn, 1987; cited in Dore, 1994, p. 99)

Both emotions, embarrassment and shame, led to lack of learning on the part of the students. In these examples, I treat learning as a use of information, with the learning "making a difference" (in Bateson's terms) in the cultural, social, and economic capital of the students. In other words, learning (in these examples) could have led to increased knowledge of a culture (cultural capital), a larger

network of mutual acquaintance and recognition (social capital), and better-paying jobs (economic capital). *Not* learning led to the students' not making a difference in their capital, justifying "not learning" in these examples as CNI.

Threat to one's image as held by others was more powerful than threat to life in the study reported by Shehryar and Hunt (2005, p. 282):

> It may be argued that death is the ultimate consequence and is inherently more fear arousing than any other threat. However, getting arrested and being put in jail for drinking and driving poses a significant threat because of potentially embarrassing and troublesome consequences.

As a result of their research, Shehryar and Hunt suggested that campaigns to reduce drunk driving would be more effective if they focused on social consequences such as embarrassment, rather than on somatic consequences such as death. Jones and Leary (1994) found that information about threats to appearance provoked more safe-sun behavior than information about threats to health. Jones and Leary also found, however, an exception:

> Appearance-motivated people who tan to enhance their appearance may be particularly threatened by messages that try to deter them from tanning with information about the effects of the sun on appearance. As a result, they may experience greater reactance than people lower in appearance motivation and, thus, be more likely to reassert their freedom by resisting the antitanning message.

Thus, Jones and Leary found that a perceived threat to freedom (a threat to self-image) could override threats to one's image as held by others. Sedikides and Green (2000, p. 919) discussed the relationship between "threat to self-image" and "others' negative image of one's self":

> The human information processor is not concerned with reconciliation. Instead, he or she strives to neglect the appalling impression that other

> individuals may have of her or him, even when this impression is hypothetical.

In other words, Sedikides and Green determined that people usually have a much better impression of themselves (self-image) than others have of them, and that this impression compels nonuse of even hypothetical hints of personal inadequacy under experimental conditions, such as "would borrow other people's belongings without their knowledge" (p. 922). This example presents aspects of two elements of the taxonomy, ego threat and "least conflict." Ego threat appears to rest on a person's existential fear of the death of the person's favorable public image, justifying the inclusion of this example in this section about affect. As with threat to life and threat to health, threat to ego leads to affect, which leads to selective attention or memory, which lead to CNI. "Neglect[ing] the appalling impression" resembles the taxonomy element conflicting schemata and justifies the inclusion of this example in Section 6.2 (least conflict) below.

Attribution theory (Weiner, 1974) postulated that people will attribute their own and others' behaviors to causations that bolster self-image. In other words, people will not "use information" (allow information to make a difference) that damages self-image. For example, Tsang (2002, p. 42) noted that Nazis blamed Jews for the Holocaust ("They shouldn't have threatened the state."), rather than blame themselves ("We had no choice. We had to obey the state / kill Jews, or be killed, ourselves."):

> Perpetrators of evil can also rationalize their actions by shifting attributions of blame …. For instance, perpetrators can shift the blame from themselves to their victims …, as when the Nazis claimed that Jewish people deserved

> to be killed. Alternately, perpetrators can blame the circumstances around them for their crimes. Actors might feel controlled by other people or by the situation and feel that they are faultless, helpless victims. For instance, many Nazi doctors who participated in forced experiments and killings in concentration camps felt morally opposed to these actions. Yet, they continued to engage in these acts because they believed that if they disobeyed orders, they would be killed …. Therefore, they were able to justify their actions by assigning responsibility to their circumstances and not to themselves.

Attribution theory suggests that this attribution of motivations is not a product of traceable cognition and occurs at the intuitive level of cognition (cf. Figure 1.4: The continuum of cognition). Thus, this attribution is not under the control of the person doing the attributing. As such, the attribution compels people not to allow information about self-image and information about the image of others to "make a difference," in Bateson's terms. For these reasons, this attribution qualifies as CNI.

Fear of the unknown

Fear of the unknown compels nonuse of information simply because the information is new and unknown. As with other elements of taxonomy, "fear of the unknown" acts at the intuitive or pre-cognitive level (cf. Figure 1.4: The continuum of cognition), meaning that it represents a *compelled* nonuse of information rather than a *volitional* nonuse of information. For the purposes of this study, "fear of the unknown" includes "fear of the new" and fear of specific unknowns, such as "fear of bad news."

As mentioned above in Section 2 (prejudice), Bergen (2001, p. 161) stated: "If confronted with a new way of looking at things, they stick to the old,

tried way as if only the past can provide safe anchorage." In this context, "sticking to the old" resembles priming, discussed in Section 5.4 below. Priming, however, results in the rejection of new information because some facet of "old" information conflicts with acceptance of the new information. With "fear of the unknown," no conflicting "old" information exists. No examples in the study corpus demonstrated a specific "fear of the unknown," but Carl R. Rogers (1961) suggested a possible motivation: "we all fear change" (p. 18). "This risk of being changed is one of the most frightening prospects most of us can face." (p. 333)

Conditions modifying the effect on CNI of "threat to life, health, and ego"

In the study corpus, researchers reported three conditions that can intensify or decrease the effect on CNI of a threat to life, health, or ego. These conditions include a person's perceived "self-efficacy" (ability to produce a change in the threat), a person's affective state pre-existing before the threat, and the proximity of the threat to the person, that is, whether the threat refers to the person or to others.

Self-efficacy appeared in a study by Sprinkle et al. (2006, p. 95) as a modifier of CNI in the presence of threat.

> When a message creates a high perceived threat but the perceived response efficacy remains low, fear control processes are engaged and will dominate a person’s behavior, resulting in message rejection, denial, or minimization. However, when a message creates high perceived threat and the perceived response efficacy is also high, danger control processes are engaged and will dominate a person’s behavior resulting in message acceptance and attitude, intention, and behavioral changes.

In other words, a threatening situation provoked more CNI when the threatened person also felt ineffective in changing the threatening situation. M. M. Turner et al. (2006, p. 151) determined that people facing high threat and low feelings of self-efficacy sought and found information, but did not retain it:

> [I]t is imperative to impart efficacy-building information. At a minimum, individuals' anxieties should be addressed. In the absence of this provision, it is likely that further information delivered by the physician (after informing the patient that his or her risk is high) may not be processed or remembered, patients' desires to obtain information notwithstanding. This situation can potentially lead to adverse consequences because it is quite likely that important risk-reducing information, one that usually follows a high-risk diagnosis, will be lost on patients.

In the situation reported by Turner et al., lack of "efficacy-building information" led to low feelings of self-efficacy, which led to selective memory and CNI.

Pre-existing affective states emerged as an influence on CNI in a study by Keller et al. (2003, p. 60). People in a negative mood did not respond to "negative" information that emphasized health threats, while people in a positive mood did not respond to "positive" information that emphasized health improvements:

> [P]articipants who were in a positive affective state were more persuaded by the loss-framed than the gain-framed message, whereas participants who were in a negative affective state were more persuaded by the gain-framed than the loss-framed message.

Pre-existing affective states influenced CNI in the presence of threat to life, health, or ego, but Agrawal et al. later found this influence to depend somewhat on who was threatened, as explained in the next paragraph.

The proximity of the threat to a person, that is, *who* is threatened, emerged as a modifying influence on CNI in a study by Agrawal et al. (2007):

> [W]hen people are in happy emotional states, self-referent health appeals are more effective than family-referent appeals, whereas the converse occurs when people are in peaceful emotional states. When people are in negative emotional states--when they are sad (versus agitated)--compatible self-referent health appeals are less effective than family-referent appeals.

In other words, calm, happy people paid less attention to information that might affect the health of their families than to information that might affect their own health, while sad or agitated people paid less attention to information that might affect their own health and more attention to information that might affect the health of their families.

Wolfson (2006) analyzed the public outcry over Terri Schiavo's dying, an outcry in which many people ignored the published medical information about her death and responded instead to a perceived threat to her life. For example, all medical records in the case stated "consistently and without reservation that [Terri] was in a persistent vegetative state and that there was no hope of recovery" (p. 116). Further, all conventional revival therapies and even experimental electrode implantation had had no effect during the 14 years that doctors declared Terri to be in a persistent vegetative state. Yet, the decision to end artificial life-support aroused international outcry:

> Some of it was media hype; some was political opportunism; and much was sincere and honest distress about the way Ms. Schiavo was dying, given the totality of circumstances. (p. 118)

I believe that the "sincere and honest distress" and its manipulation by the media and by the federal and Florida state governments compelled many observers to ignore information necessary for a just analysis of the case. Specifically, Wolfson reported that people identified the case with religious and political arguments surrounding abortion, with conflicting statements about artificial life support issued at that time by the Catholic Church, and with sensationalist accounts of termination of artificial life support:

> A constant theme was the ‘‘horror’’ of removing food and water. This horror bound together the vocal constituency that sought to keep Ms. Schiavo alive, and combined with the well-publicized willingness of her parents to care for her, baffled and even angered many. (p. 117)

The amount of end-of-life legislation engendered by this case suggests that many people reacted with negative affect (horror) and used the case to influence legislation (e.g., State of Florida House Bill No. 35-E, which became Florida Public Law, Chapter 2003-418, and United States Senate Bill S. 686 CPS, which became Public Law 109-3). Wolfson reported that many of the people who encouraged this legislation reacted with horror to the details of the Schiavo case, specifically to the details about termination of nutrition and hydration.

I conclude that these people perceived a threat to their own lives if placed in a similar life-support situation, felt the utter lack of self-efficacy that the persistent vegetative state entails, and worked to change the law to provide yet more safeguards against premature termination of life support. Judging only from the Wolfson article, I conclude that affect and perceived lack of self-efficacy compelled many observers of the Schiavo case to use selective memory and

selective attention, resulting in CNI. Specifically, they did not consider information about similar life support terminations that occur every day in the U.S. "without fanfare" (p. 114). Neither did they appear to consider the fate of the $700,000 trust fund created for Terri Schiavo's maintenance or the windfall to attorneys that resulted from the Schiavo litigation and subsequent legislation. To quote Wolfson again:

> Some people did not like or accept the facts. Some people did not like or accept the law. As a consequence, some states may elect to modify their end-of-life and guardianship laws. But these decisions must be made with exceptional care to avoid doing damage to millions of people who have already executed living wills and have expressly indicated their intentions not to be maintained, as Ms. Schiavo had been. (p. 119)

Thus, affect compelled many people to not use information about Terri Schiavo's death (the persistent vegetative state; similar terminations that occur daily) and to focus instead on an imagined threat to her life.

Examples of conditions modifying the effect on CNI of "threat to life, health, and ego"

Arsenault and Castells (2006, p. 289) presented an example in which perceptions of self efficacy, pre-existing affective state (fear), and proximity of the threat affected CNI. They postulated that a climate of fear facilitated acceptance of government misinformation (described more fully in Section 3 above) by the American public about the need for a war with Iraq:

> In *Fear's Empire: War, Terrorism & Democracy*, Barber (2003) maps out the role that fear played in promoting the Bush agenda. By framing American actions in Iraq and Afghanistan as part of the War on Terror,

> Bush and his collaborators created a general climate of fear in which political dissent was considered subversive. (pp. 288-289)

If Arsenault and Castells are correct, fear of being harmed by terrorists and fear of being labeled subversive contributed to nonuse of information that conflicted with the information promulgated by the Bush administration. I conclude that other conditions also led to CNI, such as perceptions of self-efficacy:

> Terror threats and more vague warnings of impending danger had no effect. … only the Iraq War has significantly correlated with longer term increases in presidential approval ratings. As the following section will illustrate, this climate of fear was also crucial in amplifying political trust, which also played a crucial role in the widespread acceptance of misinformation about the Iraq War. (p. 298)

In other words, people felt ineffective about fighting terrorism before 9/11, and they ignored information portending terrorist attacks. After 9/11, they still felt ineffective, but the perceived threat had become greater. According to Sprinkle et al. (2006, p. 95) and M. M. Turner et al. (2006, p. 151), both quoted above, high perceived threat and low perceived efficacy lead to "fear control processes." I conclude that CNI was one such process: by supporting the invasion of Iraq, people felt that they had some efficacy. I conclude that these people would have felt less efficacy had they not accepted the information promulgated by the Bush administration and accepted conflicting information.

Ray described a mechanism for the interaction of perceived threat and perceived self-efficacy, in effect describing the point at which CNI appears:

> [T]here is a critical point when perceived threat is greater than perceived [self-]efficacy. At this point we stop thinking we can avert the threat and begin to control our fear rather than the danger, and reject the [threatening] message. (2003, p. 187)

Pinquart (2002, p. 319) presented another example in which perceptions of self efficacy, pre-existing affective state (fear), and proximity of the threat affected CNI. Pinquart determined that older adults rejected negative old-age-stereotyped information for a number of reasons:

> First, they may reject negative age-stereotyped information [characterizing the elderly as, for example, incompetent, fragile, senile, inarticulate, depressed, lonely, and neglected (p. 318)] as inapplicable to older adults in general, or as inapplicable to themselves, for example, because they do not perceive the source of information as trustworthy, or they do not perceive themselves as old, or because they restrict the applicability of the negative information to a subgroup of older adults they do not belong to (e.g., the oldold, or nursing-home residents). Second, older adults may shift their reference point of self-evaluation, by comparing oneself against the stereotyped negative view of old age in general instead of integrating the stereotyped information into their self-perceptions. Downward social comparisons (comparisons with other older adults in worse circumstances) have been characterized as an important mechanism of psychological adaptation of older adults …: People selectively choose less fortunate social referents or actively derogate them so that their own standing is enhanced.

Mechanisms underlying Pinquart's reasons that older adults reject negative old-age-stereotyped information include protection of ego and self-image, fear of death-reminders, and perceived lack of self-efficacy in controlling the aging process. All of the reasons appear to compel nonuse of information.

Summary of Section 5.3, affect

This section described examples of CNI caused by affect: threat to life, threat to health, threat to ego, attribution theory, and fear of the unknown. The following section describes CNI caused by priming. Affect may appear in the examples of priming, and some examples from the study corpus may appear in

both sections, affect and priming. Priming consists of a category separate from affect, however, because priming does not require affect to compel nonuse of information, and affect does not require priming to compel nonuse of information.

5.4 Priming

Priming describes a method of apportioning attention, in which the presentation of a stimulus alters the detection or identification of a subsequent stimulus (after Winn, 2001, p. 1253). As with other forms of selection, priming compels nonuse of any contradictory information. Priming superficially resembles habituation (described in Section 1.2 of Chapter 4), in that both phenomena create a predisposition for some information at the expense of other information. Habituation, however, relies on a physiological rejection of stimulus, while priming relies on a cognitive bias for accepting stimulus. Priming resembles the taxonomy elements described above in Section 2 (prejudice) and Section 3 (authoritarian control). The elements of Sections 2 and 3, however, represent somatic barriers pushing against information, while priming results from a cognitive barrier representing lack of pull (cf. Table 4.1). Some elements of priming also resemble "least conflict" (described further in Section 6.2), but an important distinction differentiates priming from "least conflict." in cases of priming, a person rejects information based on the nature or source of the information. In cases of "least conflict," however, a person rejects information based on its ability to contradict previously acquired information. For example, consider the curious sentence: "Time flies like an arrow, but fruit flies like a

banana." From the first clause, most people will think of "flies" as verb. The first clause will prime them not to use "flies" as a noun in the second clause. With most people, the priming of this example will be of very short duration. That is, the stimulus created by the verb "flies" in the first clause will be replaced very quickly the stimulus created by the noun "flies" in the second clause. In any priming situation, however, in which a person must respond to the stimulus before the priming effect disappears, the person will respond to the previously primed (wrong) information. In other words, priming will compel nonuse of the correct information. For example, I was driving in Mexico once, and my guide kept saying *"derecho, derecho"* (keep going straight). At one point, she said with little warning *"derecha"* (turn to the right). Being primed to expect *derecho*, I did not recognize *derecha* until the turn had passed. The priming compelled me to not use the correct information until it was too late. The following examples discuss four facets of priming, outlined in Figure 4.9 and explained below.

5 Attention shortfall
5.4 Priming
a Lexical priming
b Priming with respect to the source of the information
c Potential sources of priming
d Priming via naïve conceptions

Figure 4.9: Four facets of attention shortfall caused by priming.

Lexical priming

Hoey (2005) formulated a new theory in language processing, which he called "lexical priming." In brief, the theory states that people choose a word because they have encountered the word before under similar circumstances more than they have encountered *other* words under those circumstances. That is, a person's experience of a word determines the choice of the word. According to the theory of *semantic* priming, the *proximity* in the example given above of "flies" as a verb to "flies" as a noun primes an incorrect interpretation of "flies" as a verb, rather than a noun, in the second clause. According to the theory of *lexical* priming, however, the *familiarity* of the phrase "time flies like an arrow" primes the incorrect interpretation of "flies" in the second clause. For the purposes of this study, lexical priming and semantic priming have similar effects, and this study uses the phrase "lexical priming" to refer to priming based on linguistic phenomena.

Gernsbacher and others (Gernsbacher & Faust, 1991; Gernsbacher, 1993; Gernsbacher & Robertson, 1995) determined that the speed of the rejection of the incorrect meanings of words increased as a reader gained skill in reading. That is, skilled readers, more often than unskilled readers, chose the correct meaning of words. Paulson found somewhat different results under somewhat different conditions: both skillful and non-skillful readers read only 60 to 70% of words and interpreted passages based on the words they read: "Expectations, predictions, and hypotheses are crucial to perceptions, both of the

world in general and of text." (Paulson, 2002, p. 62) The predisposition that leads skillful and non-skillful readers, this selective attention to 60 to 70% of words, compels nonuse of the information from the unread 30 to 40%.

Regardless of reading experience, CNI via priming can occur through the use of euphemisms. For example, Tsang (2002, p. 40), citing Arendt (1963), suggested that the Nazis used euphemisms such as "final solution … not to keep people ignorant of the massacres but to 'prevent them from equating [the massacres] with their old, "normal" knowledge of murder and lies' (p. 86)." As described in Section 2 above, in the example of Nazis referring to death camps as "charitable foundations for institutional care," threshold knowledge shortfall (Section 4) will exacerbate the CNI that results from priming (Section 5.4). All of these examples (Gernsbacher et al., Paulson, and Tsang) of experience affecting word choice and word choice affecting experience indicate to me the applicability of Hoey's theory of lexical priming. The next section discusses priming based on a very different mechanism, source priming.

Source priming

Chute & Wiener (1996) described priming with respect to the source of the information. They found that many commercial airline pilots expected flight attendants to know nothing about flight operations. The pilots tended to ignore trouble reports from people that the pilots expected to know nothing, so they ignored reports from the flight attendants. The pilots rejected the trouble reports based on the *source*, rather than on the reports themselves. This element of the

taxonomy resembles the socio-environmental barrier of prejudice based on lack of cultural capital, described in Section 2 above. Prejudice, however, reflects the somatic barrier of lack of capital pushing against information, while source priming reflects a cognitive barrier caused by lack of pull (cf. Table 4.1). Whether elements of prejudice or elements of source priming predominate in a given situation, both contribute to CNI. The following section continues the discussion of these two sources of CNI, prejudice and priming.

Potential sources of priming

Judging from the co-occurrence of prejudice and priming examples in the study corpus, prejudice and priming frequently work together to compel nonuse of information based on the source of the information, with prejudice reflecting a push and priming reflecting a lack of pull (cf. Table 4.1). One reason for the co-occurrence of prejudice and priming could be that prejudice can lead to the form of priming known as source priming, in which a person is compelled not to use information because of a prejudice about the source of the information. As with authoritarian control (Section 3), priming can result from both inadvertent and intentional installation of prejudice. For example, the instillation of prejudice in children by their families could be an example of inadvertent priming if the models from whom the children learned were unaware of the prejudice and priming. Bergen (2001) described instillation of prejudice:

> Models have their most powerful influence on children below the ages of 7 or 8. Early in their preschool years children can define their race and other physical, mental or ethnic categories. Preschool children show bias in favor

> of their own sex, favor classmates over unfamiliar children, choose more negative adjectives to describe others and often show bias toward other ethnic groups. The child can become prejudiced by adopting the biases and attitudes of the family and by living in an environment that fosters prejudice. (p. 154)

Bergen linked this instillation of prejudice to fear of the new or unknown: "If confronted with a new way of looking at things, they stick to the old, tried way as if only the past can provide safe anchorage." (p. 161) Section 5.3.4 (above) described fear of the unknown. "Source" priming differs from "fear of the unknown" because source priming bases the nonuse of information on a known phenomenon (the source of the information) while "fear of the unknown" rejects information because the information is new.

The mass media can be a source of intentional source priming via authoritarian control. Intentional source priming pervades societies with mass media to the extent that the practice of this priming has its own jargon. Such media use of priming is known as "framing": "selecting and highlighting some facets of events or issues, and making connections among them so as to promote a particular interpretation, evaluation and/or solution." (Entman, 2004, p. 5; quoted by Mickiewicz, 2005, p. 357). As with prejudice, the use or nonuse of information occurs because of the source, rather than because of the information. With lexical priming and source priming, a third source of priming is priming via naïve conceptions, discussed next.

Priming via naïve conceptions

"It is what we think we know already that prevents us from learning" (widely attributed to Claude Bernard [1813-1878]). This study adopted the term "naïve conceptions" from the article by Reiner et al. (2000, p. 1), in which naïve conceptions referred to "an underlying commitment to existing knowledge," where the existing knowledge was based on misconceptions. Olson (1995, p. 46) explained priming via naïve conceptions in terms of levels of abstraction:

> [W]hen evidence meeting one's knowledge criteria discredits a highly valued knowledge claim, one may use dissociation to revise one's knowledge criteria … rather than reject the knowledge claim. … such a practice … protects the knowledge claim by moving to a higher level of abstraction than the level of the evidence. It resolves an incompatibility in a way that not only renders irrelevant the immediate complication, but also immunizes the thought system from similar future incompatibilities.

Dore (1994, p. 99) described two mechanisms of naïve conceptions that were similar to Olson's "rendering irrelevant" and "immunizing." Dore used these mechanisms to explain why women's prior educational experiences prevented them from learning (Dore did not discuss men's prior educational experiences).[1] The first mechanism was based on the *information* presented in a learning situation, and the second mechanism was based on underlying *thought structures*. In the first, women met challenges to belief systems by rejecting the information (the "threatening material"):

> According to Dunn, women may be particularly vulnerable to this learning barrier because of … the ethical barrier, which is aroused when students' values or belief systems are challenged in the classroom. The hierarchical authority structure in the traditional classroom gives students little

[1] Dore presented three mechanisms, and Section 5.3 (threat to ego) discussed the first.

> opportunity to openly explore or respond to challenges to their personal beliefs or ethical understandings. As a result, students are likely to close themselves off and reject threatening material. (Dunn, 1987; cited in Dore, 1994, p. 99)

In the second mechanism by which a woman's prior educational experiences prevented her from learning, pre-existing thought structures invoked cognitive dissonance instead of acceptance of the new information.

> [T]he critical/logical barrier is raised when new learning does not fit into the existing thought structure, resulting in cognitive dissonance for the student. The hierarchical nature of the traditional classroom does not encourage the kind of student/teacher dialogue that would enable students to resolve the dissonance causing this barrier to learning. (Dunn, 1987; cited in Dore, 1994, p. 99)

Dore's second mechanism of preventing learning resembles Olson's "dissociation," "moving to a higher level of abstraction," and "immunization." Dore's second mechanism also resembles least conflict via cognitive dissonance, described further in Section 6.2. "Priming via naïve conceptions" differs from "least conflict via cognitive dissonance" because naïve conceptions prevent the acceptance of new information without comparison of the naïve conceptions with the new information, while "least conflict" involves some comparison and acceptance of the information that causes the least conflict.

This differentiation between naïve conceptions and least conflict finds substantiation in the discussion of prejudice in the study corpus in the sense of prejudice resulting from naïve conceptions. In the following example, "miseducation" and "faulty definition" led to naïve conceptions, which led to racism. Brandon (2006, p. 197) quoted Joyce E. King in calling "dysconscious

racism" "an impaired way of thinking that is a result of one's miseducation." King defined racism as injustice (p. 207). Allport described the pervasiveness of prejudice, a pervasiveness that mirrors the fundamental nature of naïve conceptions. According to Allport, prejudice:

> [I]s often lock stitched into the very fabric of personality. In such cases it cannot be extracted. To change it, the whole pattern of life would have to be altered." (Allport, 1958; quoted in Bergen Jr., 2001, p. 161)

I interpret this statement by Allport to mean that naïve conceptions become so closely enmeshed with personality (consistent patterns of behavior) that to change the conceptions would change personality. The naïve conceptions lead to prejudice, which leads to CNI.

The following examples use language that presents CNI as a function of naïve conceptions, as Reiner et al. (2000, p. 1) defined naïve conceptions: "an underlying commitment to existing knowledge." However, the examples also contain overtones of affect, specifically, fear of death and fear of death reminders. Morgan and J. K. Miller (2002, p. 166) described the "myths and misconceptions" that prevent organ donation in the U.S.:

- fear of not really being dead
- fear of feeling pain after death
- desire to avoid body mutilation
- distrust of the medical system
- desire to preserve family harmony
- respect of limits set by God or nature
- lack of basic knowledge about organ donation
- lack of knowledge about brain-death
- lack of knowledge about Western religion's support of donation
- lack of knowledge about medical ethics.

According to Morgan and Miller, "85% of Americans are already aware of the need for organ donors; moreover, the majority feel positively toward donation" (p. 164). Miller's myths, however, consist of naïve conceptions (as Reiner et al. define naïve conceptions) that compel a nonuse of information about organ donation. Thus, even though 85% of Americans feel positively toward donation, only about 19% of eligible donors have signed donor cards (p. 164). Specifically, naïve conceptions prevent the use of information such as statements that the medical community does not remove organs until a donor is "really" dead, or that virtually all Western religions approve of organ donation (p. 166). Similarly, Wolfson (2006) presented causes of the mass hysteria surrounding Terri Schiavo's death (described in Section 5.3 above), in which many people clung to naïve conceptions about dying and did not use the medical information about her death. "Michael Schiavo … had been told consistently and without reservation that his wife was in a persistent vegetative state and that there was no hope of recovery" (p. 116). Giacalone et al. (2007, p. 369) found that " Elderly patients … [had] grown up in an era when cancer was regarded as the ‘unsaid illness’ or ‘the incurable disease’." In other words, these naïve conceptions were among the elements of the taxonomy (such as affect) that compelled elderly patients not to seek or use information.

Birch (1990, p. 518) reported another example of naïve conceptions compelling nonuse of health-related information:

> Adults like foods that are high in fat, sodium, and refined carbohydrates and may also dislike foods that are considered healthy. The limited evidence

> suggests that these patterns of food acceptance … are primarily learned: induced by culture and acquired through experience. Changing diets in ways consistent with the dietary guidelines is difficult because these changes are counter to existing patterns of food acceptance that have taken a lifetime to develop.

In other words, according to Birch, naïve conceptions (learned patterns of food acceptance) were among the elements of the taxonomy (such as affect) that compelled elderly patients not to seek or use information (dietary guidelines). This example also may include elements of information filtering via cost-benefit, an element discussed in Section 6.1.

Summary of Section 5: Attention shortfall

Section 5 presented attention shortfall; that is, the lack or loss of attention to a phenomenon. The section discussed engrossment, distraction, affect, and priming as the four primary causes of attention shortfall. Section 6 presents information filtering, the last of the cognitive barriers compelling nonuse of information.

6. Information filtering

Information filtering (the acceptance of some information and the rejection of other information) is a *cognitive* barrier to information use, rather than a *somatic* barrier. As a cognitive barrier, it joins threshold knowledge shortfall (Section 4) and attention shortfall (Section 5) on the "lack of pull" side of the taxonomy. If the nonuser of information becomes aware of the information filtering and *continues* in the nonuse of information, the nonuse then becomes

volitional (VNI), which is beyond the scope of this study. As with other examples of selection, information filtering implies the use of some information and the nonuse of other information. Homeostasis could be an example of information filtering, but the preponderance of somatic examples of homeostasis qualifies homeostasis as an example of intrinsic somatic conditions, described in Section 1 above. Information filtering takes several forms, but the forms cluster into two categories outlined in Figure 4.10 and described below.

6 **Information filtering**, caused by:
- 6.1 Least effort
- 6.2 Least conflict

Figure 4.10: Information filtering that leads to CNI.

These two categories frequently overlap, because conflict requires effort and reduced conflict requires reduced effort. For example, Baker, discussing defensiveness in communication (1980, pp. 34-35), cites Engel et al. (1968, p. 205):

> [O]ur basic beliefs, values, and attitudes become so entwined with our total mental system that a change in one area has a complex carry-over effect on countless other related areas. Thus, changing beliefs and attitudes which are most strongly held requires major restructuring of the mind…. Stated simply, we would often rather be wrong than change our minds.

Baker then cites Carl R. Rogers (1961, pp. 18 and 333): "we all fear change…. This risk of being changed is one of the most frightening prospects most of us can face." Does Rogers's example resemble least effort? Or of least conflict? Or

of affect leading to least effort leading to least conflict? Other examples of this overlap appear in the following two sections.

6.1 Least effort

This *least effort* category derives its name from the work of George Kingsley Zipf (1949), *Human Behavior and the Principle of Least Effort: An Introduction to Human Ecology*. Although many researchers and scholars have questioned the application or precision of Zipf's Principle of Least Effort (e.g., Newman, 1956; Rapaport, 1957; Wyllys, 1975, 1981), the phrase "least effort" provides a succinct way of expressing the attribute that I see to be present in each of the four conditions leading to CNI described in this section. In other words, when a person responds to stimulus with an information behavior, each of the four elements this category of "least effort" represents an information behavior involving the least effort that the person can use. For example, intuitive (pre-cognitive) avoidance of overload (element 6.1.a) requires less effort than facing overload. Resignation (element 6.1.b) requires less effort than not being resigned. Avoidance of information where perceived cost exceeds perceived benefit (element 6.1.c) requires less effort than using information where perceived cost exceeds perceived benefit. Avoidance of activity involving "the life of the mind" (element 6.1.d) involves less cognitive effort than engaging in activity involving "the life of the mind." This section explains the effect of each of these four elements on CNI. Specifically, these elements comprise information filtering, similar to the concept of selection mentioned before. The information

allowed through the filter implies the nonuse of information filtered out, particularly so when the information filtered out contradicts the information allowed through the filter. "Least effort" occurs in the four elements outlined in Figure 4.11 and described below.

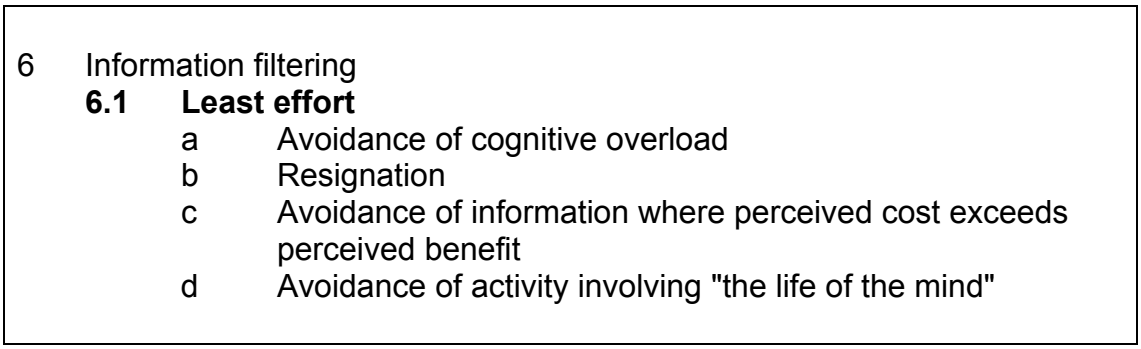

Figure 4.11: Four facets of information filtering caused by least effort.

Avoidance of cognitive overload

C. E. Wilson (1976, p. 63) reviewed the literature discussing information overload and concluded: "In sum, information overload is not a clear concept, and probably does not need to be; it is a phantom." Others, however, have determined that it exists (Flood, 1975, p. 45) and can be quantified in some contexts (G. A. Miller, 1956, p. 81).

Examples of avoidance of information overload appeared in several of the articles in the study corpus and in other corpora. McKnight (2006, p. 149) related the stories of critical care nurses who sometimes did not use information available in one complex system by simultaneously attempting to use multiple complex systems:

> One person wholly concentrating on using one complex system was one thing; many people dealing with several complex systems at once was quite another. Something might be different in one information system from what was in another.

In other words, when a nurse worked in an environment where many nurses used one complex system or where that nurse simultaneously used several complex systems, the information overloaded or threatened to overload the nurse's cognitive abilities. In the case of the nurses, CNI could have resulted from the distraction of attending to multiple systems competing for attention (Section 5.2 above), but I postulate that prolonged or multiple distractions constitute cognitive overload.

Sir Walter Scott (1816/n.d., p. 94) provided another example of overload familiar to many scholars, an inability to locate information through an "embarrassment of riches":

> So saying, the Antiquary opened a drawer and began rummaging among a quantity of miscellaneous papers, ancient and modern. But it was the misfortune of this learned gentleman, as it may be that of many learned and unlearned, that he frequently experienced on such occasions what harlequin calls *l'embarras des richesses*; in other words, the abundance of his collection often prevented him from finding the article he sought for.

The Antiquary relied on memory, rather than on finding aids, and the quantity of his collection overloaded (exceeded the limits of) his memory. Ikpeza and Boyd (2007, p. 645) attributed the difficulty experienced by novice Internet users in learning from the World Wide Web in part to information overload:

> Navigational disorientation arises from information overload, where learners may be overwhelmed by the vast amount of information on the Web and lose track of their search subject or simply become fatigued. Also, the nonlinear hypertext environment of the Internet means that information is

> sometimes unorganized. This places significant cognitive demands on learners to make appropriate connections between concepts …. It is unlikely that many students who use the Internet possess adequate skills and strategies to efficiently and effectively negotiate the realms of available information to learn new content knowledge.

Critical care nurses, experienced scholars such as the Antiquary, and Internet novices all experienced or sought to avoid cognitive overload, and cognitive overload contributed to their CNI.

Aldoory and van Dyke (2006, p. 346) conducted an experiment to determine the reactions to a simulated terrorist attack on the food supply. They found that "news coverage increased feelings of 'information overload,' which led participants to shut down cognitively and deny the need for protective action":

> Cognitively, though, some interesting findings emerged that related to what may be termed "information overload," Participants described what appeared to be a limited capacity for processing information—when that capacity was reached or exceeded some participants shut down information seeking. (p. 356)

Overload and fear of overload are two of several elements that can result in CNI through a related element of the taxonomy, resignation.

Resignation

Resignation describes a condition involving indiscriminate nonuse of information. If we placed the elements of CNI on an active-passive continuum, resignation would occupy the most passive end of that continuum. Resignation appears to intensify other conditions leading to CNI, as mentioned in Section 5.3 (Affect) and Section 6.2 (Least Conflict). Resignation can result from a wish to withdraw from an external control, a wish to avoid people or situations, or even a

wish to withdraw from life. Precipitating events include an excess of information impinging on a person, as mentioned above, or from a person's decreased ability to use information. For example, Fry and Prentice-Dunn (2005, p. 140) identified a condition that they called "hopelessness" and suggested that hopelessness decreased a person's ability to try to use information about staying healthy:

> Hopelessness conveys that the person feels that there is no solution to the threat (e.g., “In this day and age, it sometimes seems a hopeless task to stay healthy.”).

In this example, hopelessness and apparent lack of a solution led to resignation, a failure to see information, and CNI. Brunel and Pichon (2004, p. 366) described five such withdrawal strategies that they termed "avoidance strategies." These strategies involved a resignation from the use of information about the health effects of various foods. In this example, the ultimate truth of the food information does not matter, because this study described information that people perceived to be true at the time of nonuse. Brunel and Pichon's five strategies include: behavioral disconnection (It's bad for me, but I eat it anyway.), denial (It's not as bad as they say.), fatalism (We're doomed anyway.), cognitive repression (I don't think about it.), and magic thought (My body can handle it.). All these forms of resignation lead to CNI.

Another manifestation of resignation appeared in Goldsmith (1999, p. 304). Goldsmith used the term "negative face" to describe "the claim to respect for autonomy and rights to non-imposition" by a person who desires to maintain a distance or disengagement from others in social settings. Westerners not familiar

with the Eastern concept of face might recognize a somewhat corresponding term from Western popular culture, "profile." Where face and profile refer to a person's standing or appearance in the public eye, negative face and "low profile" refer to a person's *not* being prominent or visible to the public eye. Goldsmith specifically described situations in which one person gave advice to another person and threatened that other person's negative face:

> [T]he defining features of directives (including advice, asking favors, enforcing obligations) involve predicating a future act and indicating the speaker thinks the hearer ought to do it—an intrinsic threat to negative face. (p. 306)

In other words, Goldsmith postulated that these situations (giving advice, asking favors, enforcing obligations) threatened the information recipient's wish to be let alone. One way that the recipient can maintain negative face is resignation--withdrawal from perceived external control or from people or situations. Resignation involves indiscriminate nonuse of information. The next section describes information behavior that is less indiscriminate, but still intuitive and pre-cognitive.

Avoidance of information where perceived cost exceeds perceived benefit

Cho and Cheon (2004, p. 90) studied the effect of advertisements on Internet searching:

> [C]onsumers might feel that the navigation process to locate desired content is difficult on the Internet because Internet ads disrupt or intrude on their overall search for desired information, which may result in a retreat from the source of interference (i.e., ad avoidance). We therefore hypothesize that perceived goal impediment, indicated by consumer search

> hindrance, disruption, and distraction, may evoke ad avoidance on the Internet.

In this example, users measured the cost of using information from the Internet in terms of time and effort spent navigating through ads. When the perceived cost of finding information on the Internet exceeded the perceived benefit of the information, the search stopped, and the users did not find or use the information.

Freyd (2006, p. 518) added social to cognitive and emotional motivations for not using information, defining "social" as:

> [A]ll the reasons individuals repress as a consequence of social pressures to not know and to doubt memories, and in response to an implicit need to isolate information from awareness in order to maintain a whole host of social (intimate, communal, political) relationships.

In other words, the maintenance of social relationships outweighed the benefit of the information. Examples of the information not used included memory of "childhood abuse perpetrated by a caregiver" (p. 518), "not knowing about the [obvious] adultery" (p. 519), "people systematically remain[ing] unaware of observable betrayals by their own government" (p. 519), and knowledge of "betrayal (particularly by commanding officers) as a key factor in soldiers' harm from war" (p. 519).

Kreling et al. (2006, p. 1096) presented a medical example, in which a librarian, trained to "wade through" information, felt that reading general information about breast cancer was not worth the effort, unless the material pertained to her specific condition:

> I couldn’t read it until I knew what I was looking for. I found it extremely stressful to wade through this information and, being a librarian, I am trained to wade through information. I’m usually very curious about everything, but not this time. I didn’t want to know anything except what applied to my case.

In the librarian's case, her doctor had provided information that the librarian considered irrelevant and not worth sorting through. Brooks et al. (2003, p. 911) suggested a mechanism to explain "cost-benefit":

> Because people have finite cognitive resources, they typically do not retrieve all available information about an object when making their decision. To conserve their cognitive resources, people attempt to retrieve only the information necessary to make their decisions.

These examples of information filtering by least effort (negotiating Internet ads, maintaining social relationships, and "wading through" medical information) all compelled nonuse of information for which perceived cost exceeded perceived benefit. The next section involves no cost-benefit balancing. The examples of the next section appear to weigh only cost and to minimize it.

Avoidance of activity involving "the life of the mind"

Others had used "anti-intellectualism" previously (e.g., Spargo, 1911; Fairchild, 1931; Humphrey, 1951; Jeffrey, 1951), but Hofstadter's *Anti-Intellectualism in American Life* (1963) popularized the concept of anti-intellectualism as an attack on the life of the mind by forces that he identified as science, business, religion, utilitarianism, egalitarianism, practicality, and vocationalism. His book won the 1964 Pulitzer Prize for non-fiction and might have had more of an impact on American anti-intellectualism, but the Kennedy

assassination eclipsed it (and most other news) in the popular media and, therefore, in the popular mind.

The Kennedy assassination prompted congressional investigations of television-inspired violence, but popular culture continued to center around media violence. This study defines media violence as depictions of acts of violence such as murder, assault, and rape that appear on television, in movies, and in video games. Media violence occurs in presentations that are fictional, fiction based on fact, "reality TV," documentaries, and news broadcasts:

> By the time the average American child graduates from elementary school, he or she will have seen more than 8,000 murders and more than 100,000 other assorted acts of violence (e.g., assaults, rapes) on network television. (Bushman & Anderson, 2001, p. 478)

Media violence in America proved so seductive that it created in America a culture in which the media provide continually more violent entertainment via a mechanism remarkably similar to addiction. In other words, media violence satisfies an artificial need that it has created--and then increases that need:

> [T]he first exposure to violent media can make a person (especially children) anxious and fearful …. Repeated exposure reduces these effects and *leaves the viewer wanting stronger doses of violence*. (Bushman & Anderson, 2001, p. 481, emphasis added)

Gathercoal (1999, p. 16) explained the biological mechanism underlying this addiction to violence in terms of a homeostatic desensitization to endorphin production and uptake:

> In essence, individuals can move their homeostatic need for endorphins further along the "normal" continuum. The resulting physical condition is one where more and more endorphin activity is needed in order to feel "normal."

Johnston (1993) described the measurement of this addiction in the terms used by the television industry: "jolts per minute." He defined a jolt as "the moment of excitement generated by a laugh, a violent act, a car chase, [or] a quick film cut" and noted that "regular jolts of empty stimulation are the easiest and cheapest means of keeping viewers glued to the screen."

But does media violence compel nonuse of information? I conclude that it does, similarly to the neuro-chemical mandates described in Section 1.2 (e.g., psychotropic drugs and alcohol) and the intrinsic somatic conditions of Section 1.4 (e.g., false memories or Narcissistic Personality Disorder). Media violence, neuro-chemical mandates, and psychotic delusions compel a person to inhabit a fabricated world. For example, in the world of network television drama, approximately 2% of the characters are murdered every night, a percentage far higher than the percentage of people murdered in American society (Medved, quoted in Bushman & Anderson, 2001, p. 479). Alcohol and drugs create a world of artificial emotions and perceptions, which is why driving under the influence (of alcohol or drugs) is a crime in most states. A number of the pathologies listed in the *DSM-IV* compel a person to live in a world of delusions. In these fabricated worlds, the life of the body dominates the life of the mind. Addiction to violence, alcohol, or drugs creates a neurochemical mandate strong enough to preclude awareness of the ramifications of the condition. I postulate that living in a fabricated world, whether created by media violence, drugs, or psychopathologies, acts like other examples of selection, in that acceptance of

information from a fabricated world compels the nonuse of some information from the world beyond the media, drugs, and mental illness.

In addition to addictive mechanisms that compel avoidance of the life of the mind, social and physiological reasons for television viewing appeared in the literature reviewed for this study. Gathercoal (1999, p. 18) explained the addiction to television in terms of repeated stimulation of the limbic system. He also presented psychosocial mechanisms such as symbolic modeling based on endorphic responses (p. 17). McLuhan and Q. Fiore postulated that the near-hypnotic draw of the medium (television) *was* its own message, and little more than a *massage*, as in their book's title, *The Medium is the Massage* (1967).

Hofstadter's discussion of anti-intellectualism, media violence, and the near-hypnotic draw of *any* television provided examples from the study corpus of "avoidance of activity involving the life of the mind." Ascribing these phenomena solely to "least effort" would be overly simplistic, but least effort appears to compel nonuse of information.

Summary of Section 6.1, Least effort

These four phenomena (avoidance of cognitive overload, resignation, the perception that cost exceeds benefit, and avoidance of activity involving the life of the mind) constitute information filtering by least effort. As noted in the introduction to Section 6, "least effort" overlaps with the next section, "least conflict," because reduced conflict requires reduced effort. Least effort, however,

does not always overlap with least conflict, which justifies the treatment of least conflict as a separate element of the taxonomy.

6.2 Least conflict

Least conflict denotes conditions leading to CNI that lessen conflict between schemata. In this study, a schema is a mental set, a conception based on prior experience, that helps a person to process information (Bartlett, 1932; as cited in Winn, 2001, p. 1478). Specifically, "least conflict" compels a person not to use information from a schema of the world that might conflict with the person's own schema.

"Least conflict" superficially resembles other elements of the taxonomy. As mentioned in Section 6.1 ("least effort") above, "least conflict" allows a person to live in the surrounding environment with a minimum of conflict with that environment, and this minimum of conflict requires less effort than living in conflict. The elements of the taxonomy described as least conflict, however, invoke other concepts that differentiate least conflict from least effort. For example, *deference to a cognitive authority* resembles least effort, because questioning a cognitive authority requires more effort than not questioning a cognitive authority. Deference to a cognitive authority, however, involves more than least effort: it includes the concept of cognitive authority. The added concept of cognitive authority qualifies deference to a cognitive authority as an element of least conflict, rather than least effort, because I feel that the added specificity of the source of conflict deserves to be recognized. *Ego threat* represents another

example of an element that resembles least conflict. For example, Shermer (2004, p. 46) determined that people thought of themselves as more moral, righteous, and friendly than others:

> Stanford University students … predictably rated themselves higher. Even when the subjects were warned about the "better than average" bias and asked to reconsider their original assessments, 63 percent claimed that their initial evaluations were objective, and 13 percent even claimed to be too modest.

"Affect--threat to ego" could qualify as the CNI mechanism at work in Shermer's experiment. A decrease, however, in the students' self-perceptions of being "better than average" to a self-perception of their being "average" does not (in my opinion) threaten ego as much as it presents conflicting schemata. On that basis, Shermer's example qualifies as a "least conflict" element of the taxonomy rather than a "threat to ego" element. Substantiating my opinion, Eisenstadt et al. (2002, p. 289), citing Greenwald (1980):

> [D]escribed the self as inherently cognitively conservative, capable of interpreting and willing to interpret self-relevant information and to "remember" personal history in a manner consistent with (and usually flattering of) an ongoing and stable self-concept. The stability of the self-concept is highly functional, allowing people to preserve a continuous self-identity which makes their world more predictable and themselves more predictable to the world.

According to Eisenstadt et al.'s article, preservation of ego against threat creates predictability. The predictability then serves as a basis for filtering information for "least conflict." Both "fear of ego threat" and information filtering by "least conflict" compel nonuse of information in Eisenstadt et al.'s article, but I use the article as

an example of "least conflict" because least conflict appears to me to be the condition that leads to CNI, while fear of ego threat leads to least conflict.

Least conflict subdivides into four elements, outlined in Figure 4.12 and described below.

6	Information filtering	
6.2	**Least conflict**	
	a	Avoidance of irrelevant or "wrong" information
	b	Avoidance of cognitive dissonance
	c	Principle of the best
	d	Deference to cognitive authority

Figure 4.12: Four facets of information filtering caused by least conflict.

Nickerson (1998, pp. 190-197) described several of these elements of information filtering by least conflict under the term confirmation bias (the inappropriate bolstering of hypotheses or beliefs whose truth is in question…. unwitting selectivity in the acquisition and use of evidence, p. 175). Nickerson (1998, p. 197) also postulated motives for confirmation bias, including threat to ego (described in Section 5.3 above), avoidance of "wrong" information (described below), cognitive limitations (described in Section 1 above), a lack of understanding of logic (described in Section 4 above), and the "principle of the best," described below. Other articles describe fewer elements. The elements that follow appear in the order of my estimation of their increasing susceptibility to mitigation. That is, I estimate that mitigating the elements that appear first (e.g., avoidance of irrelevant or "wrong" information) will, in general, require more

additional information than mitigation of elements that appear later. As stated in the introduction to this study, mitigation refers to a modification or reduction of CNI. We judge the mitigation sufficient when a person's behavior changes in response to the information formerly not used. This concept of additional information does not mean that CNI *will* be mitigated or *should* be mitigated; only that the particular element *could* be mitigated with sufficient additional information.

Avoidance of irrelevant or "wrong" information

This element of the taxonomy, avoidance of irrelevant information, resembles the cost/benefit element described in Section 6.1 above. This "avoidance of irrelevant information," however, involves no cost/benefit comparison, because no perceived benefit exists. For example, Simon-Arndt et al. (2006, p. 16), citing Witte (e.g., 1992), postulated that Marines who did not feel that they abused alcohol and Marines who drank heavily rejected information from an alcohol misuse program as irrelevant to their personal situations:

> [H]eavy drinkers who do not believe they can change their behavior will reject the message regardless of discomfort resulting from their level of risk, and those who do not feel they are at risk will not respond to it.

Simon-Arndt et al. reported that approximately 15% of the Marines rejected information including:

> Heavy drinking risk information … General alcohol information … including facts about legal intoxication levels, underage drinking, safety, myths, depressant effects, and how the body processes alcohol. … practical tips to reduce the negative effects of alcohol … such as alternating alcoholic drinks with nonalcoholic drinks, keeping track of the amount of alcohol

> consumed, refraining from playing drinking games, arranging to get home before a party or drinking occasion, looking out for friends when drinking, and information about designated drivers. (p. 16)

I speculate that Simon-Arndt et al. felt that more Marines should have modified their behavior in accordance with the information from this program, because the information involved cooperation and the safety of comrades, mainstays of Marine Corps tradition. The 15% who rejected information from this program might have been unaware of the potential benefits of the program to their personae as good Marines. I believe that this rejection was compelled, because, in my experience, few Marines act volitionally to the detriment of the Corps or to their personae as good Marines. I also believe that this rejection was compelled, because the rejection correlated with two groups, those who drank heavily and those who did not feel that they were at risk. In other words, psychologic and physiologic characteristics compelled these two groups not to modify their behavior. Had the lack of behavior modification been volitional, I feel that other groups also would have failed to modify their behavior. Therefore, I believe that the rejection of the information constituted CNI.

In another example of avoidance of irrelevant information, Soliah et al. (2006, p. 729) tested 115 college women enrolled in Food Science and Nutrition courses and determined that:

> The two dominant reasons for being unable to prepare basic foods were they had never been taught (knowledge barrier) and they had no interest in learning (attitude barrier).

The women were majoring in nutrition science, nursing, allied health, or family and consumer science:

> Most of the college women in this study (59%) also developed the habit of eating out one to three days/week; the remainder (41%) were eating out four or more days/per week. The data from this study indicate that as eating out frequency increases, cooking ability decreases.

I conclude that the availability of food cooked elsewhere resulted in the attitude that the information about cooking was irrelevant. This attitude then compelled the women to reject the irrelevant food information.

The 9/11 attack on the World Trade Center prompted Cronin (2005, p. 399) to investigate the response to warnings received by the U.S. intelligence community: "Intelligence consumers often hear what they want to hear and ignore evidence that does not fit or support their view of the world." As a result:

> [FBI] agents failed to understand or act upon this information in the broader context of information the FBI already possessed about terrorist efforts to target or use U.S. civil aviation. (Shelby, 2002, p. 5; quoted in Cronin, 2005, p. 397)

Assuming that Shelby interpreted his evidence correctly, the FBI agents were compelled by "their view of the world" to regard information from the Phoenix Memo as irrelevant or wrong.

Garmon (2005, pp. 282-283), quoting McDiarmid and Price (1990, p. 21), reported a situation that resembled "naïve conceptions" (Section 5.4, priming via naïve conceptions):

> Educational experiences, no matter how well designed and presented, may still prove ineffective because students [the pre-service student teachers] "are unlikely to reconsider their deeply held beliefs and unconscious assumptions unless these are deliberately confronted and challenged."

Garmon's student teachers appear to have been compelled by their beliefs and assumptions that the conflicting ideas were wrong. Similarly, Klaczynski et al. (1997, p. 471) discovered that college freshmen "use less sophisticated heuristics when these strategies enable them to preserve their goals and beliefs," even in important matters such as career choice.

Kupermintz and Salomon (2005) addressed the problem of Israeli-Palestinian conflict resolution, in which all participants feared a threat to the righteousness of their positions by information perceived to be wrong. To avoid this threat to schema, Kupermintz and Salomon asked the participants to study the conflict in Northern Ireland:

> A direct approach to help program participants step into their adversary's shoes and legitimize its perspective may arouse strong resistance during conflict as it may threaten participants' sense of righteousness. On the other hand, learning about another remote conflict may circumvent that obstacle. It paves the way for what Perkins and Salomon (1992) have called high-road transfer, which affords the opportunity for mindful abstraction--the creation of a bird's eye view of conflicts. Such a view enables the application of conclusions reached regarding the remote conflict to the proximal one. The indirect way appears to be an effective one. (p. 300)

In this example, Kupermintz and Salomon reported success in developing empathy among the participants. The "bird's eye view" permitted participants to accept the value of viewpoints derived from opposing perspectives of an intractable conflict and even to accept information garnered from the opposing side's perspective. Before the development of empathy, participants had refused to consider information that conflicted with their sense of identity and righteousness. In short, they perceived that information to be wrong. Marines

who did not drink or who drank heavily, college women who did not cook, the FBI, school teachers, college freshmen, and participants in intractable conflicts all demonstrated a compelled avoidance of information perceived to be irrelevant or wrong.

Avoidance of cognitive dissonance

Cognitive dissonance, proposed by Festinger (1957), suggested that a person would avoid information that conflicted with self-image, and that self-image derived from "comparisons with the abilities, achievements, and opinions of others" (Case et al., 2005, p. 354). Mills (1965, p. 593) used a Likert-scale instrument in a test/re-test protocol to establish that his respondents, groups of approximately 70 university women, avoided dissonant information and sought out consonant information. Specifically, when offered a choice of one of several free cosmetic products, they subsequently preferred to read ads for the products that they had chosen, rather than the ads for the products they had not chosen. Some mechanism beyond the control of the women compelled them to seek information that substantiated their previous choice and to avoid information that might have contradicted their previous choice. Avoidance of cognitive dissonance resembles fear of threat to self-image, described in Section 5.3 above. Cognitive dissonance, however, appears to involve avoidance of conflicting information, while threat to self-image appears to involve fear of threatening information. Either one tends to compel nonuse of information.

Principle of the best

This element of the taxonomy derives its name from *"Tout est pour le mieux dans le meilleur des mondes possibles"* (All is for the best in the best of all possible worlds), a phrase used frequently in the novel *Candide* (Voltaire, circa 1758). In the novel, Professor Pangloss (said to be modeled after the philosopher Leibniz) espoused the principle of the best, also known as "unrealistic optimism" (N. D. Weinstein, 1980, p. 806) or the "Pollyanna principle" (Matlin & Stang, 1978; cited by Nickerson, 1998, p. 197). According to Matlin and Stang, this principle notes the apparent compulsion that people experience in giving preferential treatment to pleasant thoughts and memories over unpleasant ones. Some people might describe this compelled selection as good in that it allows a person to survive in a hostile environment. Other people might describe this selection as bad in that it might allow a person to miss warnings. This example illustrates the importance of studying nonuse of information without imposing moral judgments. This element resembles the element of affect, described in Section 5.3 above. However, affect appears to compel nonuse based on an existential fear of death, whereas principle of the best appears to compel nonuse through a conflict with schema.

Deference to cognitive authority

Deference to cognitive authority denotes the acceptance of information by virtue of its coming from a trusted source. Sources identified in the study corpus included the state, religion, and the "expert." As with other examples of selection,

use of the selected information implies nonuse of some of the information not selected. In such a situation, the "used" (accepted) information, the information that made a difference, comes from a trusted source. Conversely, the nonused information comes from sources that possessed less cognitive authority. The example on page 1 of this dissertation, the suppression of women's potential in American society, provides an example: according to Dore (1994) and Dunn (1987), authority figures (educators and parents) lower the expectations of female students. Lowered expectations lead to satisfaction with lower performance, resulting in the students fulfilling less of their potential as they grow up.

Tsang (2002, pp. 39-42) described many of the ways in which Nazi authorities compelled the German people to support tacitly the events that led to the Holocaust. The study reported here has identified several of those ways as CNI, including authoritarian control (described in Section 3), threshold knowledge shortfall (described in Section 4), affect (described in Section 5.3), and lexical priming (described in Section 5.4). Nazis also employed racial prejudice (described in Section 2) against Jews and Gypsies and priming via naïve conceptions (also described in Section 5.4) to support their theories of race and nation. Germans of that era acknowledged the cognitive authority of the Nazis (described in this section) and accepted euphemistic language as literal, abrogation to the state of personal responsibility, the dehumanizing and blaming

of the victims, and assurances of moral justification. These techniques constituted CNI.

Arsenault and Castells (2006) reported similar acceptance of cognitive authority in the U.S.:

> [T]he Waxman Report … details 237 misleading statements released by President George Bush, Vice President Dick Cheney, Defense Secretary Donald Rumsfeld, now former Secretary of State Colin Powell, and now former National Security Advisor Condoleezza Rice about Iraq and WMDs [weapons of mass destruction]. (p. 292)

Arsenault and Castells then reported that, during the war that followed, trust in cognitive authority continued. I interpret this continued trust as an example of CNI, in which the information that the need for war had been falsified was not used:

> [O]ver an 18-month period despite the introduction of compelling evidence that prewar intelligence was falsified or exaggerated, the belief that the Bush administration presented faulty information fluctuated by only 12 points, rising from 36 percent in February 2003 to 48 percent in November 2004. Moreover, these polls suggest that skepticism regarding the existence of WMDs actually peaked in March 2004 (around 55 percent) and then decreased despite mounting evidence that no weapons existed. (pp. 292-293)

Brunel and Pichon (2004, pp. 368-369) described another facet of cognitive authority, confidence placed in "risk-reduction transmitters" (p. 368). These risk-reduction transmitters provided to food consumers information that reduced "psychological discomfort caused by consumption of foodstuffs coming from the agricultural and foodstuff industry" (p. 360). They identified these risk-reduction transmitters in the food production and distribution industry as "the producer [of the food], the retailer, the state or even independent organisations

(such as consumer associations)." Trust in the benevolence and wisdom of these transmitters of information compelled the consumer not to seek or use other information.

Aldoory and van Dyke (2006, p. 346) provided an explanation for this trust of risk-reduction transmitters in their experiment to determine the reactions to a simulated terrorist attack on the food supply. They found that "When participants perceived the source of information was in 'the same boat' as them, they were more likely to pay attention." I conclude that this statement means that the German people probably believed that their leaders faced the same threats (from internal sources such as minority groups and external sources such as France and Poland) as they, and trusted the leaders in part for that reason. Similarly, the American people probably believed that the Bush administration faced the same threats (from terrorists inside America and a worldwide network of terrorists beyond America) as they, and this perceived shared danger may have contributed to acceptance of misinformation and disinformation about the need for war with Iraq.

Granfield (2002) reported an example of *mistrust* of a cognitive authority in a study in which a university administration tried to reduce alcohol use among students. The effort failed:

> Nearly 85% of the students report having seen a social norm message on alcohol use at least once or twice per week throughout the seven-month intervention period. Almost half of these students indicated that they saw social messages on a daily basis. … Despite this success with implementation, comparison data between the baseline and follow-up years

> indicated little change in the perceived campus drinking norm or in reported alcohol use by students after the intervention. (p. 22)

Granfield suggested that mistrust by the students of the administration restricted the students' acceptance of information about alcohol use reduction:

> By associating the [alcohol use reduction] campaign with an administration that they see as trying to exercise increased control over them, students have 'framed'… the marketed norms campaign in negative terms that restricts most from accepting the information as legitimate. (p. 27)

Granfield's use of the word "framed" calls to mind priming, described in Section 5.4 above. As stated at the outset of this study, many conditions leading to CNI overlap. Granfield's example appears in this section because it describes a specific type of priming that derived from mistrust of an authority, rather than priming in general.

Fry and Prentice-Dunn (2005, p. 140) identified religiosity as a mechanism of CNI: “When it comes to the possibility of developing breast cancer, I think it is best to pray and put the problems in God’s hands.” This example might resemble the resignation of Section 6.1, except that resignation does not incorporate the element of displacement of responsibility that appears here as deference to a religious authority, a religious authority generally perceived as being omniscient and therefore a cognitive authority.

Pratkanis and Gliner (2004, p. 283) cited the concept of cognitive authority or trusted source as expounded in Plato's dialogue "Laches" (circa 400 B.C.E./1961): "it is reasonable to follow the advice of a skillful master as long as the advice is limited to the expert’s specific domain of expertise." Pratkanis and

Gliner, cited Weinstein and Deutschberger (e.g., 1963), who expanded the concept of expertise into *altercasting*, in which one person places another "into a social role that specifies an interpersonal task (e.g., message acceptance or rejection)." By experimentation, Pratkanis and Gliner determined that people tended to trust information from sources in the appropriate altercast role and reject information from people in inappropriate roles. In their experiment, a young girl urged people to buy an automobile tire in two different commercials, one commercial emphasizing safety, and the other emphasizing the technical performance of the tire. Then a "tire expert" did the same:

> [T]he pattern predicted by altercasting theory was obtained. Specifically, when the child argued for Darnelli tires on the basis of safety (the protection theme), she was much more effective … than when she argued for Darnelli tires on the basis of performance (the technical message; …). In contrast, the expert was most effective when he argued for Darnelli tires on the basis of performance … compared to arguing on the basis of safety. (p. 294)

A somewhat earlier example of mistrust of a cognitive authority occurred in the fable of the boy who cried "wolf" (Aesop, circa 560 BCE/1947, p. 132). The boy developed cognitive authority by virtue of his position as shepherd. He lost his authority through exposure in a succession of lies. Cognitive authority resembles the taxonomy element labeled priming with respect to the source of the information, discussed in Section 5.4, except that in Section 5.4, nonuse occurred because of the information *source* while, in mistrust of cognitive authority, nonuse occurred because of the *information*. In other words, with priming, *nothing* the source offered would be accepted while, with mistrust of cognitive authority, *some* information (information appropriate to the source)

would be accepted. Both elements overlap with avoidance of irrelevant or "wrong" information, as discussed previously.

Summary of Section 6: Information filtering

This section presented a number of elements of the taxonomy under the heading of information filtering, as outlined in Figure 4.13.

6 Information filtering, caused by:
- 6.1 Least effort
  - a Avoidance of cognitive overload
  - b Resignation
  - c Avoidance of information where perceived cost exceeds perceived benefit
  - d Avoidance of activity involving "the life of the mind"
- 6.2 Least conflict
  - a Avoidance of irrelevant or "wrong" information
  - b Avoidance of cognitive dissonance
  - c Principle of the best
  - d Deference to cognitive authority

Figure 4.13: Information filtering that leads to CNI.

These elements, with those of Sections 1-5, comprise the conditions leading to CNI that I found in the study corpus. As described elsewhere, other elements may exist, and the next section suggests some.

Other conditions leading to CNI

Other expected terms for conditions leading to CNI did not appear in the study corpus. Specific terms included Sandstrom's "optimal information foraging" (Sandstrom, 1994, 1999), seeking "fit" via Bourdieu's Habitus (Certeau, 1984;

Lizardo, 2004), "satisficing" (Simon, 1957; Byron, 1998), the limits of short-term memory (G. A. Miller, 1956), and cognitive barriers such as a mismatch between eidetic and symbolic imagery (Luria, 1968, ch. 5; Norman, 1993, chapters 2 and 3). These omissions suggest that the study corpus might not have included a wide enough variety of databases and indicate the need for a corroborating or refining study. Databases that might include scholarly articles that contain the omitted terms include LIS Full Text, Gender Studies Database, Contemporary Women's Issues, Annual Reviews Online, Sociological Abstracts, Philosopher's Index, and Alt-Press Watch.

Summary of Chapter 4

This chapter presented and explained the elements of the taxonomy of conditions compelling nonuse of information, which appeared in Figure 1.1 of Chapter 1 above. When considered together, the elements of Figure 1.1 comprise a *taxonomic* definition of CNI, one of the five types of definitions identified by Spradley and McCurdy (1972), as explained in Chapter 3 above. The taxonomy consisted of the six primary categories of elements:

1) Intrinsic somatic conditions,
2) Socio-environmental barriers,
3) Authoritarian controls,
4) Threshold knowledge shortfall,
5) Attention shortfall, and
6) Information filtering,

and their various subcategories.

Chapter 4 also discussed the criteria used in ordering the taxonomy. Other orderings are possible, and Chapter 4 explained the choice of the ordering used for this dissertation. A discussion of the dichotomous nature of CNI-VNI followed the discussion about ordering, and Chapter 4 concluded by presenting additional conditions, conditions that the study was expected to find but did not.

Many of the examples from the study corpus depicted CNI pejoratively -- advanced age, acceptance of war, avoidance of food and health information, gender prejudice, the Terri Schiavo case, illiteracy, Nazi euphemisms, resignation -- and these examples *do* represent situations that most people would call undesirable. Had the examples of CNI produced peace, good health, or gender equality, Chapter 4 would have included far fewer depictions of CNI as negative. This likely outcome illustrates the importance of diagnosing CNI without prejudice.

The next chapter, Chapter 5, summarizes the study and presents recommendations for further investigation of CNI.

CHAPTER 5: CONCLUSIONS

As I conclude this initial study of compelled nonuse of information, I am struck by the many examples of nonuse of information that surround each of us, inevitably observed through a window rather than in a mirror. And I wonder, what information was I compelled not to use in order to initiate and pursue this study? Among the hundreds of thousands of academics, pedagogues, orators, librarians, and psychologists who have built careers on the *use* of information, does merit exist in an analysis of *nonuse*? What information might I have overlooked that would render this entire study moot? And should such a novel topic be investigated through the virtually untried methodology of retroduction? But Charles Sanders Peirce said that "no new truth is ever otherwise reached while some new truths are thus reached" (1976b, pp. 319-320, from Peirce's 1902 "Prolegomena"), and the investigation regains importance for me. Whether anyone else ever employs this methodology, and whether this study leads to "new truths" in the study of information, it has led to new truths for *me*. One that I wish to share with my readers is this: tragedy does not rest on sadness. Tragedy rests on the *inevitability* of sadness. Compulsion, almost by definition, leads to inevitability. In situations where nonuse of information leads to sadness, *compelled* nonuse of information leads to tragedy. The study of nonuse of information has exposed to me a great deal of tragedy in the human condition, for example, greed mistaken for nationalistic or religious fervor and leading to empire and war, ignorance leading to fear of the "other" leading to enslavement

or murder, or lack of threshold nutritional knowledge leading to pathology and premature death. It is my hope that this study can mitigate some of the compulsion that leads to sadness and reduce the inevitability that turns that sadness into tragedy.

Summary of the study and its contributions to information science

As noted in Chapter 1, this dissertation identified or developed several key concepts and potential advancements in the study and practice of information science, such as:

1) presentation of a methodology for investigating a phenomenon for which prior study has not established a theory, models, or data;
2) refinement of the vocabulary of information science through a definition of compelled nonuse of information (CNI);
3) inception of the formulation of a theory of CNI;
4) presentation of a conceptual or diagnostic tool for information workers;
5) increased awareness of prejudice against nonuse of information;
6) theoretical advancement in the design of information systems;
7) development of *nonuse* as a Hegelian antithesis to information *use*;
8) development of "markers of anti-intellectualism" as an aid to the formation of public policy; and
9) clarification of some of the legal and jurisprudential ramifications of CNI.

Recapitulation of each of these concepts follows.

1. Presentation of a methodology

The methodology presented in this dissertation lends itself to any investigation of phenomena for which no one has established prior theory, models, or data. The methodology consisted of a novel nine-step *retroduction* heuristic that incorporated a novel five-step *definition* heuristic. This dissertation then presented the application of these heuristics to a comprehensive and integrated study of CNI.

2. Refinement of the vocabulary of information science

This dissertation defined terms and phrases frequently used in information science, such as "cognitive avoidance" and "information behavior." For example, the study reported here defined the difference between "volitional" and "compelled" and demonstrated the need to discriminate between volitional and compelled cognitive avoidance. The study also presented a definition of "information behavior" as "a response to a stimulus, where the stimulus is information and the response is use or nonuse of that information." This definition avoids the common definitions of information behavior that are self-referent, that is, that define information behavior in terms of information and behavior.

The study reported here rested on additional definitions. Bateson's definition of "Information" as "a difference that makes a difference" led to a definition of CNI: "CNI describes behaviors beyond the control of a person, behaviors that do not allow a difference to make a difference."

In addition to facilitating discourse between people who use these terms, the definitions also establish a firmer foundation for information workers who wish to influence public policy discussions. As society moves further into information-based economies and governance, information workers should develop a clearer and more assured voice in the formation of public policy, and explicit definitions of information science concepts contribute to that voice.

3. Inception of the formulation of a theory of CNI

The study reported here resulted in a descriptive model of CNI where none has existed before. The model presented in this study consisted of a taxonomy of conditions that lead to CNI, and the taxonomy consisted of six primary components:

1) Intrinsic somatic conditions,
2) Socio-environmental barriers,
3) Authoritarian controls,
4) Threshold knowledge shortfall,
5) Attention shortfall, and
6) Information filtering.

One or more of these six components explained each of the examples of CNI discovered in the informal pilot study and formal study described here.

The model presented here contains a measure of external validity (generalizability) and internal reliability (predictability, coherence) because of the retroductive methodology of its creation. In other words, this study employed an iterative technique consisting of formulation, testing against a corpus (the informal pilot study), reformulation, testing against another corpus (the formal

study), reformulation again, re-coding (the re-study), and reformulation again. The reformulations eventually became cosmetic, rather than substantive, resembling the concept known as data saturation. This decreasing lack of substantive change from iteration to iteration demonstrated the degree of "fit," the applicability, of the model and its taxonomy to analysis of the rather large body of literature examined.

As noted in Figure 1.5 above, the model of CNI described the subset of information behavior referred to in this study as *compelled* nonuse. Appendices 2 and 3 present 118 descriptions of information behavior. As explained in Chapter 2, very few of those behaviors referred to *nonuse* of information, and none of them discussed CNI. The model presented in this dissertation complements those 118 descriptions in the sense that nonuse is the implied opposite of use. Thus, the model of this dissertation fills a large gap in the concepts of information science. If the study of CNI proceeds as recommended in the next section, this descriptive model will become a predictive theory and create a wider basis for understanding information behavior.

4. Presentation of a conceptual or diagnostic tool for information workers

The information worker who now encounters an apparent nonuse of information must understand the situation in relation to hundreds of theories and models of information behavior, such as those noted in Appendices 2 and 3. Employment of Figure 1.1 would reduce the analysis to the six elements. If the situation did not match one or more of the six elements, then the situation would

constitute volitional nonuse (VNI), a useful determination in itself. For example, a teacher might confront illiteracy by determining whether the inability to read is volitional or compelled. If compelled, what part of the inability is somatic and what part cognitive? If somatic, is the illiteracy due to an intrinsic inability, such as poor eyesight due to aging? A socio-environmental barrier such as distance from a school? An authoritarian control such as the American educational system in the days before bilingual education? If cognitive, is the illiteracy due to threshold knowledge shortfall such as unawareness of the concept of writing? An attention shortfall due to perceived lack of self-efficacy? Information filtering based on avoidance of the life of the mind? I contend that an analysis of the CNI by means of these six elements of the taxonomy will lead to a more efficient and effective response. I also contend that these six elements are relatively easier to remember, understand, and apply.

5. Increased awareness of prejudice against nonuse of information

Inherent in any information worker's fruitful response to CNI is a lack of prejudice or emotional bias. Information science, however, in its focus on *use* of information, has portrayed nonuse as undesirable, and this portrayal might be inefficient and even irrelevant to an examination of CNI. Several examples of this portrayal appeared in the corpora examined for this study:

a. Two articles (Rousseau et al., 1998; Giacalone et al., 2007) portrayed advanced age as negative, but S. W. Cornelius and Caspi (1987) noted positive aspects of intelligence increasing with age.

b. Four articles (Arendt, 1963; Lifton, 1986; Tsang, 2002; Arsenault & Castells, 2006) discussed the role of deception in facilitating war. Had the examples discussed the use of deception in *ending* war, we might view the CNI in a more positive light.
c. Paulson (2002) noted that most readers ignore 30 to 40% of the words in a text, leading occasionally to misunderstanding. This selective attention, however, also allows a person to read more quickly, which most people would consider to be positive.

In addition to specific examples of the positive effect of CNI, C. Harris (p. 70) suggested more encompassing and fundamental reasons to avoid the presumption that nonuse of information is bad, specifically, that 1) reasons might exist for a nonuse, 2) that a nonuse might not be a problem, or 3) that a nonuse might be an intractable problem. This dissertation presents to information workers the need to separate bias and prejudice from a response to nonuse of information.

6. Theoretical advancement in the design of information systems

As a diagnostic tool with which information workers can respond to nonuse of information, the taxonomy can help to evaluate nonuse of information systems. For example, Web sites, library catalogs, highway markers, museum exhibit labels, and graphic user interfaces all present opportunities for users to not use information. Application of the model of Figure 1.1 might help a designer to create more efficient and effective information systems.

7. Development of nonuse as a Hegelian antithesis to information use

Table 3.1 presented the proportion of articles in the study corpora that discussed nonuse and use. Less than one percent of the articles discussed nonuse, indicating a trend to approach information science from the thesis of use. This dissertation explored a facet of nonuse, CNI, and established its magnitude and utility as a tool for information workers. This magnitude and utility suggest that nonuse could become an antithesis to the thesis of information use.

8. Development of "markers of anti-intellectualism"

Hofstadter (1963) described what he called anti-intellectualism in American life, but he provided no metrics by which anti-intellectualism could be measured. Neither does this dissertation present metrics, but it does present possible causes of anti-intellectualism, such as element 6.1.4 of the taxonomy (avoidance of life of the mind). If defining a problem is instrumental to solving it, then this dissertation comprises a step toward formulating public policy to address anti-intellectualism.

9. Clarification of some of the legal and jurisprudential ramifications of CNI

Many facets of our legal system take into consideration the intentionality of actions. Examples include questions that start: "Did the founding fathers intend …?" or "Did the defendant know …?" This dissertation addresses such questions through the creation and employment of a volition-compulsion dichotomy as it pertains to nonuse of information.

Recommendations for further study

In pursuing this study, I reviewed the history of a number of topics, for example, information science, bibliography, cognitive dissonance, propaganda, cognitive authority, the periodic table of the elements, psychology, biological phylogeny, and geology. Each of these topics underwent its own introduction, historical development, and subdivision into sub-topics. Each sub-topic, then, underwent further development and subdivision. This study of CNI represents the introduction of a new subdivision of information science. If CNI is to become a useful concept for the information worker, its investigation should develop through:

1) replication or refutation of this study, utilizing different databases;
2) application of retroduction to other topics of study in the humanities and social sciences, and refinement of retroduction;
3) replication of this study, utilizing specific elements of the taxonomy, such as priming and the elements that resemble priming;
4) replication of this study, utilizing specific bodies of information behavior literature;
5) development of a taxonomy of interventions to parallel the taxonomy of conditions leading to CNI;
6) development of taxonomy of compelled *use* of information;
7) development of a taxonomy of *volitional* use and nonuse of information;
8) development of a *theory* of CNI; and
9) quantification of CNI and, eventually, of information.

An explanation of each of these studies appears below, in the order listed. As noted in Chapter 3, retroduction proceeds in an iterative fashion until it produces a hypothesis testable through induction. As subsequent studies evolve from retroductive to inductive inquiries, the investigator will be able to address some of the methodological limitations expressed at the end of Chapter 3. For example,

the investigator should measure inter-coder reliability when coding the articles of a study corpus for elements in the taxonomy.

1. Replication or refutation of this study, utilizing different databases

As stated before, this dissertation may not have identified all possible conditions leading to CNI. It includes enough elements, however, to create a taxonomy and to provide a model and a limited corpus of data that provide a starting point for future research. Replication of this study by other researchers may produce other taxonomies. Comparing and combining the taxonomies of two or more studies could produce an overarching taxonomy that would be more complete than the taxonomy developed by any one study.

One such replication study would employ a corpus derived from databases not used for this study, such as:

- LIS Full Text,
- Gender Studies Database,
- Contemporary Women's Issues,
- Annual Reviews Online,
- Sociological Abstracts,
- Philosopher's Index,
- Alt-Press Watch,
- Google Scholar,
- Altavista, and
- Meta-search engines such as Dogpile, Clusty, and Ez2find.

Another such replication study might include examples of nonuse of information drawn from articles that mention nonuse *by implication*, rather than explicitly. For instance, I limited the study corpus to explicit descriptions of nonuse, for example, R. S. Taylor's Process of Asking Questions (1962) provided an explicit

example of lack of threshold knowledge. I omitted examples that implied nonuse only as the opposite of use, for example, R. S. Taylor's Value-Added Approach (1982). Kuhlthau's Information Search Process (1991) explains the impact of information searching on affect (emotional state), rather than explaining the impact of affect (emotional state, element 5.3 of the taxonomy) on information searching. A replication of this study could employ a corpus that included such examples of information *use* that only implied *nonuse*.

Yet other examples of different databases include a database consisting of the works of the authors cited in this study or a database of articles drawn from a culture very different from my culture, for example, Asian cultures.

2. Application of retroduction to other topics of study, and refinement of retroduction

Quoting Charles Sanders Peirce again: "All the ideas of science come to it by the way of Abduction [retroduction]." (1931-1958, pp. 144-145) If he was right, humans have performed retroduction so intuitively that we did not recognize or name it as a method of philosophical inquiry until the 20th century. And if he was right, retroduction might prove useful in investigating other completely novel topics for which no one has established theory, models, or data. The nine-step heuristic of retroduction created for this study served the purposes of this study. Application of the retroduction heuristic to other topics in the humanities and social sciences might result in a refinement of retroduction, a reduction of

retroduction to its essential components rather than its practical manifestations. A refined retroduction might then contribute significantly to human inquiry.

3. Replication of this study, utilizing specific elements of the taxonomy

Some conditions leading to CNI command their own extensive literature. For example, the role of authoritarian control in CNI occurs unsystematically in the literature of political science. The phenomena designated by the omnibus term "information overload" appear in the literatures of system theory (e.g., E. M. Rogers, 1986), psychology and psychiatry (e.g., J. G. Miller, 1960), sociology and political science (e.g., Deutsch, 1963), and information science (e.g., P. Wilson, 1995). While this study utilized some examples from the literatures of authoritarian control and information overload, it left comprehensive coverage of these topics to future research.

4. Replication of this study, utilizing specific bodies of information behavior literature

Other disciplines bring their own requirements to a study of CNI, for example, nuclear engineering, as mentioned in Chapter 2. The taxonomy developed in this study should be applied to the information behavior of other disciplines to determine the utility of the taxonomy to multiple disciplines.

The taxonomy developed in this study also could be applied to specific corpora within information science in an effort to explain the information behaviors of those corpora more parsimoniously. Such corpora include:

- *Writings of Elfreda Chatman*. The informal pilot study revealed many examples of CNI in those works of Chatman that discuss societal disadvantage. Specifically, Chatman discussed the lack of diffusion of employment opportunity information (1983; 1985; 1987b), avoidance of print media (1987a), alienation theory (1990), gratification theory (1991b), knowledge gap theory (1995), self-imposed information poverty (1996; 1999), small world theory (1998), and the related life in the round and small world theories (1999). In all, Chatman proposed 23 theories or titles of theories (see Table 2.1). The taxonomy presented in this dissertation explains those theories through five of its six elements.
- *Writings of Carol Kuhlthau*: Examples of CNI appeared in some of the works of Kuhlthau. She described affect among novice library users (1988; 1991; 1993b; 1993a) and information overload (1993b) as parts of her larger theory of the information search process (ISP). Affect and overload are two elements of the taxonomy, elements 5.3 and 6.1 in Figure 1.1.
- *Writings of Robert S. Taylor*: CNI appeared in R. S. Taylor's process of asking questions (1962; 1967). Taylor postulated that questions evolved in type from visceral to conscious to formalized to compromised, ending in a form that an information system could answer. Application of the taxonomy of CNI could enhance understanding of Taylor's process, for example, CNI 4, lack of threshold knowledge, might help to explain the questioner's inability to formulate a "conscious" (type 2) question.

- *Writings of Nicholas Belkin*: CNI appears briefly in the works describing Belkin's ASK (Anomalous State of Knowledge) theory (Belkin & Robertson, 1976; Belkin, 1980; Belkin et al., 1982a, 1982b; Belkin, 2000b, 2000a). As with R. S. Taylor's type 2 (conscious) question, Belkin postulates that an inability to verbalize questions prevents the questioner from finding an answer.

Application of the CNI taxonomy might help information scientists to explain other areas of information behavior, for example, gender or race prejudice, nonuse of medical information, and aviation catastrophes. These examples appeared in the study but by no means exhausted discussion of other topics related to CNI. The following list of topics, presented in alphabetical order, include citations encountered more or less serendipitously in this study of CNI. The citations within the lists appear chronologically and are far from comprehensive in their treatments of the listed topics, but they should appear in any study of these topics:

- Aviation catastrophes and near-catastrophes (Chute & Wiener, 1996; National Transportation Safety Board, 2006)
- Cultural attitudes toward food, food modification and preparation, and diet (Birch, 1990; Brunel & Pichon, 2004; McWilliams, 2004; C. Meyer et al., 2005; Leschziner, 2006; Soliah et al., 2006)
- Decision theory (Honderich, 1995, p. 180; Brooks et al., 2003)
- Financial investing and gambling (Myers, 2002)
- Game theory (Honderich, 1995, p, 304)
- Inter-/intimate partner violence (Jost & Hunyady, 2005)

- Gender prejudice (Russ, 1983; Hollway, 1984; Lips & Colwill, 1988; Collins, 1991; McRobbie, 1991; Dore, 1994; Herring, 1994; Parker, 1996; Tong, 1998; Matlin, 1999; Reis, 2001; Rose & Rudolph, 2006)

- Medical pseudoscience ("Why do people detour to quacks?," 1954; Dichter, 1958; Bernard, 1963; Young, 1967; Bynum, 2001; Weisgerber, 2004)

- Nonuse of medical information among nurses, doctors, or patients (Cockerill, 1981; J. L. Jones & Leary, 1994; Muris et al., 1994; S. M. Miller et al., 1996; Pifalo et al., 1997; Muha & Smith, 1998; Leydon et al., 2000; Hemsley-Brown & Sharp, 2003; Keller et al., 2003; Godlee et al., 2004; Hinton et al., 2005; Azaiza & Cohen, 2006; Kalichman et al., 2006; Kreling et al., 2006; McKnight, 2006; Giacalone et al., 2007; Volk, 2007)

- Popular misconceptions and apocryphal tales, known as urban legends (Clodd, 1920; Cantril, 1940; Schuler & Parenton, 1943; D. Johnson, 1945; Medalia & Larsen, 1958; Smelser, 1962; A. Lewis, 1975; Mann & Rosenblatt, 1979; Massey et al., 1981; Wessely, 1987; Bartholomew, 1989; Boss, 1997; Bartholomew & Goode, 1999; Blackman & Walkerdine, 2001)

- Race prejudice (Allport, 1958; Allport & Ross, 1967; Collins, 1991; Locke & Stewart, 1992; R. M. Harris & Dewdney, 1994; Gould, 1996; McWhorter, 2000; Bergen Jr., 2001; Tsang, 2002; Brandon, 2006).

The exploratory nature of the study reported here precluded study of these topics. Replication of the study utilizing these specific topics of information behavior might go far to broaden the study of information from its somewhat academic introspection to a tool to understand and address social injustice.

5. Development of a taxonomy of interventions to parallel the taxonomy of conditions leading to CNI

As explained in Chapter 1 in the section titled "The rationale for a study of CNI," compelled nonuse of information can benefit a person and even be necessary to a person's survival. Other instances of CNI, however, are bad, by almost any definition of the word "bad." To address bad instances of CNI, a

future study of CNI should be conducted with the goal of producing a taxonomy of techniques that mitigate CNI. The taxonomy of the study reported in this dissertation will guide the information worker in determining which elements of CNI are present in a given situation, and the taxonomy of mitigations would guide that worker if an intervention becomes necessary.

6. Development of a taxonomy of compelled *use* of information

Figure 1.5 (above) portrayed the place of CNI in a diagram of compelled information behaviors that involve intuition, rather than deduction or induction. An expansion of the study reported here would include the development of a taxonomy of compelled *use* of information, CUI. The "nudge," defined as "any noncoercive alteration in the context in which people make decisions" (Goldstein, 2008b, p. B8; citing Thaler & Sunstein, 2008), is an example of CUI. Goldstein reported several examples of nudges, including the following. The city of Chicago painted lines across Lakeshore Blvd and spaced the lines increasingly close together before dangerous curves in the road. Drivers perceived the increasing number of lines as evidence that they were traveling faster than they really were, and they slowed down for the curves. A school installed mirrors in their cafeteria, mirrors that make a child appear somewhat heavier than the children actually appear. Children perceived their mirrored selves as unflatteringly heavy and ate less. In either example, the nudge apparently worked without the children or the drivers processing the information consciously. I base this conclusion on the success of the nudges when compared to the failure of consciously processed

behavior modification messages such as "dangerous curve ahead" signs and public service obesity messages. I believe that the word "intuitive" expresses the authors' intent more precisely than does the word "noncoercive," and that "make decisions" connotes cognition where no cognition necessarily took place. In other words, a more precise definition of nudge is "any intuitive alteration in the context in which people modify their behavior."

As explained in the definition of "compelled" in Chapter 1, Figure 1.4, Figure 1.5, and the introduction to Chapter 4, I view the presence or absence of cognition as absolutely crucial to the determination of volitional or compelled behavior. For example, a student compelled by a teacher to learn to read has the conscious choice of reading, and the high rate of functional illiteracy in the U.S. demonstrates that many students do *not* read after learning how. Expansion of the study of CNI to include CUI, therefore, would include intuitive (non-volitional) use of information from nudges, while thoughtful use of information resulting from scholastic compulsions would fall under volitional use, described in the next section.

7. Development of a taxonomy of *volitional* use and nonuse of information

Following the addition of compelled *use* to the taxonomy of compelled nonuse as described in the preceding section, a parallel taxonomy of *volitional* use and nonuse of information would complete the diagram of information behaviors portrayed in Figure 1.5 above. I would not expect such a completion to affect the the taxonomy of CNI to any great extent, but the completion would help

to classify, evaluate, and apply the thousands of reports now subsumed under the heading of "user studies" and contribute significantly to the field of information studies.

8. Development of a *theory* of compelled nonuse of information

As explained in Chapters 1 and 3, this dissertation presents a descriptive *model* of CNI rather than a *theory*, describing the "what" rather than explaining the "how" or "why." Although this descriptive model does not predict, it comprises the necessary first step in the development of an explanatory and predictive theory of CNI.

Lack of theory, however, should not delay implementation of the taxonomy in practice. As noted at the end of Chapter 3, information workers use other tools (e.g., Bradford's Law) without theoretical underpinning. By the same token, I recommend immediate consideration by the helping professions of the taxonomy as a short, comprehensive checklist for identification, diagnosis, and possible mediation of situations involving nonuse of information.

9. Quantification of CNI and, eventually, of information

As mentioned in the introduction to Chapter 4, the ordinal nature of the taxonomy demonstrates tentative indications of magnitude and direction (push/pull) for the elements of the taxonomy. Magnitude and direction describe two of the three necessary properties of a vector, the third property being specification of an origin. In the case of nonuse of information, the "origin" would

be some measure of a person's behavior before the information use/nonuse, and the vector would lead to a measure of behavior after the information use/nonuse (cf. Harmon, 1984). Refining the ordinal taxonomy into an interval taxonomy or ratio taxonomy would provide a measurement of magnitude. This similarity to vectors and Bateson's attempt to create a calculus of information suggest the possibility of a more mathematical treatment of CNI and information.

The taxonomy presented in this study establishes a basis for further investigation of CNI, about nonuse of information in general, and by inference, about information use. It could provide a deeper understanding of information behavior to practitioners in many disciplines: information science, psychology, sociology, political science, education, and communication science. It could provide a new tool to analyze information behavior, and a new way of thinking about the relationships among the information, the information practitioner, and the potential user of the information.

Postscript

I am grateful to those who read and criticized the various drafts of this dissertation and its taxonomy. Their contributions should not, however, be equated with wider agreement. As a journey into uncharted wilderness, this taxonomy represents one of many potentially useful directions. This study does not pretend to comprehensiveness: the reader, no doubt, will think of other conditions leading to CNI. Rather, this study hopes to approach comprehensivity

and to spur further research and definition of the phenomenon of compelled nonuse of information.

APPENDIX 1: SEARCH TERMS AND DATABASES SEARCHED FOR EXAMPLES OF CNI

Appendix 1 presents the databases searched on October 18, 2007 for the formal part of the study and their dates of coverage:

Source	Print version	Electronic version
Academic Search Complete		1965-2007
ARIST	1966-2007	1966-2007
Communication & Mass Media Complete		1915-2007
Educational Administration Abstracts		1966-2007
ERIC, the Educational Resource Information Center		1966-2007
Information Science & Technology Abstracts		1960s-2007
MLA International Bibliography	1925-1980	1963-2007
PsycARTICLES (exclude book reviews, human populations)		1894-2007
PsycEXTRA (limited to humans)		1894-2007
Psychology and Behavioral Sciences Collection		1965-2007
PsycINFO (exclude human populations)		1806-2007

Other databases might contain articles of interest to a study of CNI. I did not search the following databases as a part of this study:

LIS Full Text, Gender Studies Database, Contemporary Women's Issues, Annual Reviews Online, Sociological Abstracts, Philosopher's Index, Alt-Press Watch, Google Scholar, Altavista, and meta-search engines such as Dogpile, Clusty, and Ez2find.

The literatures of several disciplines contributed articles to this study of CNI. They included:

Psychology, sociology, education, communication, philosophy, and information science, with findings also from political science, religious studies, multicultural studies, and gender studies.

Search terms used during the formal part of this study included the following. The search terms represent combinations of the words cogniti[ve or ition], information, knowledge, and message with the words avoid[ance], barrier, blunt[ing or er], refus[ing or al], reject[ion], repress[ion], nonuse, and non-use:

(cognitive avoidance or cognitive barrier or cognitive blunting or cognitive refusal or cognitive rejection or cognitive repression or cognitive non-use)
or
(information avoidance or information barrier or information blunting or information refusal or information rejection or information repression or information non-use)
or
(knowledge avoidance or knowledge barrier or knowledge blunting or knowledge refusal or knowledge rejection or knowledge repression or knowledge non-use)
or
(message avoidance or message barrier or message blunting or message refusal or message rejection or message repression or message non-use)

APPENDIX 2: SELECTED THEORIES OF INFORMATION BEHAVIOR, listed alphabetically. (Described in Chapter 3: Methodology.)

TITLE	Date	CNI?
1. Adoption of Intellectual Technologies (Wildemuth, 1992): Resource Acquisition, Application Development, Adoption/Renewal, Routinization/Enhancement, and External Adoption	1992	No. IR (USE), not CNI
2. Affective Load (Nahl, 2004) need, preference, attitude, task motivation, expected and felt effort, uncertainty, self-efficacy, optimism, relevance, satisfaction, and acceptance of or loyalty to the system. uncertainty, frustration, anxiety, irritation and rage. uncertainly, frustration, time pressure, and pessimism	2004	5.3, Negative affect
3. Alienation Theory (Chatman, 1987a, 1990): information & most life-events are meaningless due to powerlessness, meaningless (jobs), physical isolation & lack of trust, self-estrangement/meaningless work, normlessness/lack of fit.	1987, 1990	2, Environmental barriers 3, Authoritarian control 6.1, Resignation 6.2, Least conflict
4. Anomalous State of Knowledge (Belkin & Robertson, 1976) user's lack of knowledge >> user's question.	1980	4, Inability to verbalize
5. Archival Intelligence (Yakel & Torres, 2003) subject expertise, internalized archival theory & practice, sense making for holes in the documentary record, indirect means to evidence	2003	4, Inability to locate information
6. Barriers to Information (R. M. Harris & Dewdney, 1994) "communication accidents" or information transfer failures."	1994	4, Lack of knowledge of context
7. Behavioral Approach to IR Design (D. Ellis, 1987) starting, chaining, browsing, differentiating, monitoring, and extracting	1987	No, volitional seeking of information
8. Berrypicking (Bates, 1989) "the real behavior of information searchers"	1989	No. IR (use), not CNI
9. Big6 Skills for Information Literacy (Eisenberg & Berkowitz, 1988) Task Definition, Information Seeking Strategies, Location and Access, Use of Information, Synthesis, Evaluation.	1988	No, volitional use, not CNI

TITLE	Date	CNI?
10. Choo's General Model of Information Use (Choo, 1998) info use & sense making in organizations	1998	No. Use, not CNI
11. Cognitive Authority (P. Wilson, 1983)	1983	6.2, Deference to cognitive authority
12. Cognitive Perspectives of Information Retrieval Interaction (Ingwersen, 1996): IR depends on the user, situation, system, & domain.	1996	No, leads to CNI.
13. Cognitive Work Analysis (Rasmussen et al., 1994) CWA to guide the design of technology for use in the work place	1994	No, it is system design
14. Collective Action Dilemma (T. C. Turner et al., 2005), derived from Tragedy of the Commons (Hardin, 1968)	2005	4, Lack of knowledge of context 6.2, Avoidance of cognitive dissonance 5.3, Attribution theory 6.1, Principle of least effort 5.3.4, Fear of bad news 6.2, Avoidance of conflicting information 6.2, Avoidance of counter-productive information
15. Communicative Action (Habermas, 1973, 1987) an indestructible moment of communicative rationality is anchored in the social form of human life	1973	No. Information production, not use or nonuse
16. Communities of Practice (Wenger, 1998) a small group with a common sense of purpose and a real need to know what each other knows	1998	No. Use, not CNI
17. Comprehensive Model of Information Seeking (J. D. Johnson et al., 1995)	1995	No. Use, not CNI

TITLE	Date	CNI?
18. Computer Mediated Communication (problems) (Hiltz & Turoff, 1978; Murfin, 1994; Palme, 2000): obscures emotion, social control, status	1978	1, Somatic barriers 2, Tech barriers
19. Computer-Supported Cooperative Work (Grudin, 1994)	1984	No, only in the lack of networks
20. Cultural Model of Hall (1959) communicate via behavior more than words	1959	4, Lack of knowledge of context 5.4, Priming
21. Cultural Model of Hofstede (1991) values about how things "ought to be"	1991	6.2, Avoidance of cognitive dissonance 5.4, Priming 6.2, Avoidance of conflicting information
22. Cumulative Advantage Processes (Price, 1976): success breeds success	1976	No. Opposite would be lack of capitals
23. Diffusion of Information Theory (Chatman, 1983, 1986) value~time, opinion leaders instigate and retard diffusion of information	1983, 1986	3, Censorship 6.2, Deference to cognitive authority
24. Diffusion of Innovation Theory (E. M. Rogers, 1962) innovators, early adopters, early majority, late majority, laggards. Laggards demonstrate CNI: 1) possess no opinion leadership, 2) isolates, 3) point of reference in the past, 4) suspicious of innovations, 5) innovation-decision process is lengthy, and 6) resources are limited.	1962	2, Isolation 5.3.4, Fear of the unknown 6.1, Cost-benefit 6.2, Avoidance of conflicting information
25. Domain Analytic Approach to Scholars' Information Practices (Hjørland & Albrechtsen, 1995) ➔ Socio-Cognitive Theory of Users Situated in Specific Contexts & Domains (Hjørland, 2002) The person & the field determine the classification scheme.	1995	No. Nonuse only by selection.
26. Ecological Model of Human Information Behavior (T. D. Wilson, 1981) The user behaves within a situated context of influences.	1981	No, can derive from CNI

TITLE	Date	CNI?
27. Environmental modeling (Kochen, 1969): a learning theory	1969	No, a learning theory
28. Everyday Life Information Seeking (Savolainen, 1995) to preserve the coherence in her way of life	1995	6.2, Avoidance of conflicting information
29. Face Threat (Goffman, 1955)	1955	6.1, Cost-benefit
30. Flow Theory (Csikszentmihalyi, 1990) psychological engrossment	1990	5.1, Psychological engrossment
31. Gender Differences (Herring, 1994): posting style & communicative ethics	1994	1, Somatic (gender) barriers 5.3, Affect
32. General Model of the Information Seeking of Professionals (Leckie et al., 1996)	1996	No. Use, not CNI
33. Gratification Theory (Chatman, 1991b) life-events are meaningless due to one's social milieu. 1 Information outside world is irrelevant, 2 low expectation of improvement, 3 information from outside is not trusted, 4 time = immediate past & present, 5 mass media = escape. Sometimes equated with Small-World Theory.	1991	2, Societal barriers 6.1, Avoidance of real information 6.2, Cognitive authority 6.2, Avoidance of irrelevant information
34. Imposed Query (Gross, 1995) externally motivated information seeking (vs. self-generated)	1995	No. Use, not CNI
35. Impoverished Life-World of Outsiders & self-imposed Information Poverty (Chatman, 1996) a self-imposed policy for self protection, that leads to information poverty to preserve norms	1996	2, Isolation 3, Authoritarian control 4, Lack of knowledge of context 5.3.4, Fear of the unknown 6.1, Desire for disengagement 6.2, Cognitive Dissonance 6.2, Avoidance of conflicting information

TITLE	Date	CNI?
36. Information Acquiring-&-Sharing (Erdelez & Rioux, 2000) store, recall, link, share	2000	No. Use, not CNI
37. Information Encountering (Erdelez, 1995) set aside foreground problem to work on background problem	1995	No. Use, not CNI
38. Information Grounds (Pettigrew, 1999) synergistic environments created when people come together for a singular purpose	1999	No. Use, not CNI
39. Information Horizons (Sonnenwald, 1999) social, contextual & collaborative IBs, mapping a person's information resources	2000	No. IH results from 1-5.
40. Information Intents (Todd, 1997) goals determine IB ~ (Limberg, 1997): goals affect outcomes.	1997	No, employs CNI.
41. Information Interchange (Marcella & Baxter, 1998) context extended across multiple interactors	1998	No. Use, not CNI
42. Information Poverty (P. Wilson, 1983, p. 151; Chatman, 1996) their world is a tiny place and the supply of second-hand knowledge a very small one. See also Impoverished Life-World and Life in the Round (Chatman, various dates) and Poverty (Buschman, 1998).	1996	2, Societal barriers 3, Tacit dis/approval by an authority 6.1, Cognitive overload 6.1, Cost-benefit 6.2, Cognitive authority
43. Information Retrieval Interactions (Ingwersen, 1992) Mediator Model allows user to use own abilities during IR.	1997	No, IR design
44. Information Search Process (Kuhlthau, 1985) the effect of the 7 stages of searching on affect.	1985	No. It is the IR effect on affect, not vice versa
45. Information Search Process (Kuhlthau, 1991): user-intermediary-system gap.	1991	2, Environmental (Info system) barriers
46. Information Seeking in Context (Vakkari et al., 1997): the influences of social life, historical precedent, and the pervasive effects of communities, organizations and cultures	1996	No, CNI leads to context

TITLE	Date	CNI?
47. Information Use Environments (R. S. Taylor, 1986b) IU Environments contain problems along dimensions. Information has problems along dimensions. The mesh measures success.	1986	No. System design
48. Institutional Ethnography: social organization of knowledge (Townsend, 1983). Official v unofficial forms of knowledge (D. E. Smith, 1987)	1983	No. Research philosophy
49. Integrative Framework for Information Seeking & Interactive Information Retrieval (Ingwersen & Järvelin, 2005) The cognitive approach to meld positivistic IR and subjective info seeking	2005	No, IR (use), not CNI
50. Interpretative Repertoires (Gilbert & Mulkay, 1984; Potter & Wetherell, 1987) user paradigms	1984	No, derives from CNI
51. Invisible Colleges (Crane, 1972) Diffusion of scientific information	1972	No. Use, not CNI
52. Knowledge Gaps (lacuna) (Krikelas, 1983): avoiding unknown intermediaries while filling the gaps	1983	5.3.4, Fear of the unknown
53. Knowledge Gap Theory (Chatman & Pendleton, 1995)	1995	4, Threshold lack
54. Library Anxiety (Mellon, 1986; Bostick, 1992) Barriers: staff, affective, comfort, knowledge, mechanical	1986	2, Societal barriers 4, Threshold lack 5.3, Negative affect 5.3.4, Fear of the unknown
55. Life in the Round-Normative behavior & self-imposed Information Poverty (Chatman, 1996, 1999): 1 ambiguity, 2 imprecision, 3 private becomes public, 4 taken for granted, 5 no outside information unless critical & small world is not functioning	1996, 1999	6.1, Cost-benefit 6.2, Cognitive authority
56. Managerial Support (Wolek, 1986): encouragement leads to use of information.	1986	3, Explicit approval
57. Market Value of Information Commodities (Mowshowitz, 1992): information = the ability of a goal-seeking system to decide or control in the marketplace	1992	No, only in its absence

TITLE	Date	CNI?
58. Mooers' Law (Mooers, 1960)	1960	6.1, Cost-benefit
59. Motivational Factors (Weiner, 1974) for Interface Design (Shneiderman, 1986)	1986	No, how to avoid CNI
60. Network Gatekeeping Theory (Lewin, 1947; White, 1950; Metoyer-Duran, 1991; Barzilai-Nahon, 2004)	1947	3, Censorship / selection
61. Nonlinear Information Seeking (Foster, 2004)	2004	No. Use, not nonuse
62. Normative Behavior (Chatman & Pendleton, 1998; Chatman, 1999) 1 Social Norms (rightness & wrongness in a social world), 2 World View, 3 Social types (of persons) & typology, 4 Concept of information behavior. Sometimes equated with Small World Theory.	1998	6.2, Avoidance of the irrelevant
63. Open vs. closed mind (Rokeach, 1960) = Avoidance & Vigilance (Hoffman, 1970) = Monitoring & Blunting (S. M. Miller, 1980; Pifalo et al., 1997; Leydon et al., 2000)	1970	1, Psychological predisposition 5.3.4, Fear of bad news
64. Opinion Leadership Theory (Chatman, 1987b)	1987	3, Authoritarian control
65. Optimal Foraging (Sandstrom, 1994)	1994	6.1, Cost-benefit
66. PAIN Hypothesis (Bruce et al., 2004 submission; Bruce, 2005): personal anticipated information need.	2004	No. Storage, not use or nonuse.
67. Perceived Accessibility (Culnan, 1983, 1985)	1983	6.1, Cost-benefit
68. Perspectives on the Tasks in which Information Behaviors are Embedded (B. L. Allen, 1996): a person (or group)-in-situation approach.	1996	No, derived from CNI.
69. Phenomenography (Marton, 1981): finding and systematizing of forms of thought in terms of which people interpret significant aspects of reality. (Limberg, 1997): goals affect outcomes ~ (Todd, 1997)	1997	No. It employs CNI.
70. Poverty, leading to information poverty (Buschman, 1998): libraries, in fact, do not like or help the poor, but they should, for a better civic life for all.	1998	2, Societal barriers
71. Practice of Everyday Life (Certeau, 1984): retaining the autonomy of ingeniously defended private meanings from commerce, politics, & culture	1984	6.2, Filtering, to resist 3, Authoritarian control

TITLE	Date	CNI?
72. Principle of Least Effort (Zipf, 1949)	1949	6.1, Least effort
73. Principle of Uncertainty for Info Seeking (Kuhlthau, 1993a): uncertainty increases in a search & must be overcome	1993	5.3, Affect
74. Process of Asking Questions (R. S. Taylor, 1962): visceral, conscious, formalized, and compromised	1962	4, Inability to locate (Stage 4) 4, Inability to verbalize (Stage 2)
75. Professions & Occupational Identities (P. Wilson, 1983)	1983	No, except in its absence
76. Problematic Integration Theory & Uncertainty Management Theory (Babrow, 1992)	1992	5.3.4, Fear of bad news 6.1, Desire for disengagement
77. Question-Negotiation in Libraries (R. S. Taylor, 1967, 1968). Visceral, conscious, formalized, compromised levels of the question. Librarian hope to revert compromised to formalized.	1967	4, Inability to locate (Stage 4) 4, Inability to verbalize (Stage 2)
78. Radical Change (Dresang, 1997): linear text to hypermedia	1997	1, Mismatched intelligences
79. Reader Response Theory (Rosenblatt, 1938): efferent-aesthetic reading continuum. (Fish, 1967): privatization of meaning.	1938	6.1, Avoidance of real information
80. Reference Group Theory (Dawson & Chatman, 2001) Behavior of group (family, class, party) influences behavior of members. Perception of others = basis of self-perception	2001	No, leads to CNI
81. Reification of Information (Buckland, 1991)	1991	Not apparently.
82. Sense-Making in Individuals (Dervin, 1979)	1979	4, Threshold knowledge lack
83. Sensemaking in Organizations (Gilmore & Murphy, 1991; Weick, 1995): organizational people attend to the environment that they construct	1991	No. Use, not CNI
84. Serious Leisure (Stebbins, 1982)	1982	No.
85. Small-World Network Exploration: in persons (Milgram, 1967): in network nodes (Watts & Strogatz, 1998)	1967	No. Use, not nonuse
Small-World Theory: See Gratification Theory and Normative Behavior	--	--

TITLE	Date	CNI?
86. Social Capital (Jacobs, 1961; Bourdieu, 1986; Lin, 2001)	1961	2, Societal barriers
87. Social Constructionist Viewpoint on Information Practices (Tuominen & Savolainen, 1997): impact of culture on self-supervised information behavior	1997	No, leads to filtering.
88. Social Learning Theory = Theory of Planned Behavior (Bandura, 1977); Social Cognition (Bandura, 1986): social experience determines behavior.	1986	No, except in its absence.
Social Network Theory (Outsiders): See Impoverished Life-World of Outsiders	--	--
89. Social Positioning: by gender (Hollway, 1984); individual social history & goals, & group norms (van Langenhove & Harré, 1999); by physical, digital, & social space (Given, 2002)	1984	No, leads to CNI.
90. Spatial Location of Information (George A. Miller, 1968): some humans locate information [sources] spatially	1968	1, Mismatched intelligences
91. Speech Act Therapy (Austin, 1962) speech IS act	1962	Not apparently.
92. Strength of Weak Ties (Liu & Duff, 1972; Granovetter, 1973): weak ties allow information to enter an otherwise closed social system. Human Networks (Gosser, 1991) Strength of weak ties in orgs. > tech.	1972	No. Use, not nonuse. Opposite might be 6.2
93. Symbolic Violence (Foucault, 1977; Bourdieu, 1991): the power of words and thoughts	1977	3, Implicit / explicit dis/approval 3, Enforcement
94. Transtheoretical Model of Health Behavior Change (Prochaska, 1979; Prochaska & DiClemente, 1983): stages of behavior change, drawn from several theories	1979	No, except in its absence
95. Undiscovered Public Knowledge (Farradane et al., 1973; Swanson, 1986)	1973	2, Geographical or temporal barrier 4, Inability to locate 5.4, Priming
96. User-Driven Model (R. S. Taylor, 1986a)	1986	No. CNI might be one factor.

TITLE	Date	CNI?
97. Value Sensitive Design (Friedman, 1997): computers should & do have human values	1997	No, derives from CNI.
98. Value-Added Approach (R. S. Taylor, 1982, 1986b). See also Information Use Environments.	1982	No, except in its absence
99. Willingness to Return (Durrance, 1989): indicator of search success	1989	6.1, Cost-benefit
100. Women's Ways of Knowing (Belenky et al., 1986)	1986	1, Somatic barriers 2, Societal barriers
101. World Wide Web Information Seeking (Choo et al., 1998): motivations (the strategies and modes of viewing and searching) and moves (the tactics used to find and use information)	1998	No. IR motivations
102. Zone of Intervention (Kuhlthau, 1996): proximal information professionals can help a seeker to overcome the principle of uncertainty	1996	6.2, Deference to cognitive authority
103. Zone of Proximal Development (Vygotsky, 1978): the child learns by imitating proximal adults	1978	6.2, Deference to cognitive authority

APPENDIX 3: SELECTED INFORMATION BEHAVIORS

TITLE	Date	CNI?
1. Browsing (Chang & Rice, 1993) Info use, then info use in context.	1993	No, CNI underlies browsing.
2. Elicitation as Micro Level Information Seeking (Wu, 1993) question-asking and IR system design do not inform each other.	1993	No. Use, not CNI
3. False Positives (Applegate, 1993) satisfied with inadequate information via material satisfaction multiple path emotional satisfaction	1993	5.4, Priming 6.1, Principle of least effort 6.1, Cost-benefit 6.1, Satisficing 6.2, Avoidance of irrelevant information
4. Fear Appeals (Janis & Feshback, 1953)	1953	5.3.4, Fear of bad news 6.1, Desire for disengagement
5. Information Activities in Work Tasks of Varying Complexity (Culnan, 1983; Byström & Järvelin, 1995) complexity increases use of less accessible sources.	1995	6.1, Cost-benefit
6. Information Gathering Patterns and Creativity (Maizell, 1960)	1960	No. Use, not CNI
7. Keeping Found Things Found (W. Jones et al., 2001) knowledge management	2001	No, Storage, not CNI
8. Multitasking (Miwa, 2001; Spink et al., 2006)	2001	No, IR
9. Rounding: ambiguity, imprecision, public, taken for granted, only critical outside information (Chatman, 1999), & Dissonant Grounds: rounding by organizations (Solomon, 2005)	2005	No, derived from CNI
10. Scholarly Migration (McCain, 1984): active refocusing v passive re-evaluation	1984	No, except in its absence
11. Selection & Censorship (Asheim, 1953, 1983)	1953	3, Authoritarian controls
12. Specialization (Bar-Hillel, 1963)	1963	6.1, Avoidance of overload
13. Stopping Behavior (Zach, 2005)	2005	6.1, Satisficing
14. Web Information Behaviors of Organizational Workers (Detlor, 2000): organizational, user, and interface factors in Web use	2000	No, derives from CNI

TITLE	Date	CNI?
15. Work Task Information Seeking & Retrieval Processes. Information systems should be designed to meet human IR needs (Hansen, 1997).	1997	No, derives from CNI.

APPENDIX 4: LIBRARY OF CONGRESS SUBJECT HEADINGS

To compile this list of Library of Congress Subject Headings (LCSH), I searched for the term "information" on the Library of Congress Web site "Classification Web" (Library of Congress, 2006). The search revealed several hundred subject headings containing the word "information," and I chose those headings that I concluded to be pertinent to *use* of information or *nonuse* of information. I based my conclusions on my familiarity with the literatures about the use and nonuse of information.

The terms appear here in alphabetical order. The primary term appears first, followed by other terms (in parentheses) for which the primary term is the preferred term. Any Library of Congress annotation then follows a colon. Column 1 (Use/CNI) denotes whether the subject heading refers to information use, and if the subject heading does not refer to use, which element of the taxonomy of Figure 1.1 appears to be associated with the nonuse (CNI #). Column 2 contains the LCSH. I assigned the Use or CNI # of Column 1 to each LCSH based on my familiarity with the literatures about the use and nonuse of information. Eleven subject headings reflected CNI (CNI #), and 15 reflected use (Use).

Use/CNI	Library of Congress Subject Heading
Use	1. Business information services--Use studies (Business information services--Utilization [Former Heading])
CNI 4	2. Common fallacies (Blunders; Errors, Popular [Former Heading]; Fallacies, Common; Information, Misattributed; Misattributed information; Misconceptions, Popular; Misinformation; Mistakes, Popular; Popular errors; Popular misconceptions)
Use	3. Cross-language information retrieval (CLIR (Cross-language information retrieval); Multilingual information retrieval; Polyglot information retrieval)
CNI 2	4. Cyberterrorism: Here are entered works on attacks or threats of attack against any portion of an information infrastructure.
CNI 2	5. Digital divide (Divide, Digital; GDD (Global digital divide)): Here are entered works on the perceived gap between those who have access to the latest information technologies and those who do not.
CNI 3	6. Disinformation: Here are entered works on false, misleading, or trivial information deliberately planted by an intelligence organization to confuse another nation's intelligence operations.
CNI 5.2	7. Distraction (Psychology) (Divided attention)
CNI 3	8. Executive privilege (Government secrecy; Secrecy in government)
CNI 3	9. Foreign news--Censorship
CNI 3	10. Freedom of information in the church (Secrecy in the church)
Use	11. Human information processing (Information processing, Human)
Use	12. Human information processing--Age factors (Age factors in human information processing)
Use	13. Human information processing--Effect of drugs on
Use	14. Information behavior (Information-seeking behavior): Here are entered works on the ways human beings interact with various sources and channels of information, including both active and passive information-seeking, and information use.
Use	15. Information literacy (Literacy, Information): Here are entered works on the ability to recognize when information is needed and to locate, evaluate, and use the required information effectively.
Use	16. Information retrieval (Data retrieval; Data storage; Information storage and retrieval; Retrieval of information)
Use	17. Information services--Use studies (Use studies about information services)
Use	18. Information visualization (Visualization of information)

Use/CNI	Library of Congress Subject Heading
Use	19. Intellectual freedom (Access to ideas; Freedom of thought; Freedom to read)
Use	20. Leaks (Disclosure of information)
Use	21. Library information networks--Use studies
Use	22. Personal information management (Information management, Personal; PIM (Personal information management))
CNI 3	23. Selective dissemination of information (Dissemination of information, Selective; Information dissemination, Selective; SDI (Information services))
CNI 5 CNI 6	24. Selectivity (Psychology) (Attention, Selective; Selective attention; Selective perception)
CNI 4	25. Uncertainty (Information theory) (Measure of uncertainty (Information theory); Shannon's measure of uncertainty; System uncertainty)
Use	26. Use studies: Use as a topical subdivision under types of information resources, information services, libraries, library resources, and publications for works about use studies about those resources or services.

APPENDIX 5: A DIFFERENT TAXONOMY OF CNI, one based on the transmission model of communication

A taxonomy of compelled nonuse of information, based on the transmission model of communication (Figure A5), might work as well as the taxonomy based on cognitive involvement (Figure 1.1). Documentation of this transmission model originated with Aristotle (1954, original 350 B.C.E.) as "speaker-speech-audience" and found modern expression in the book *The Mathematical Theory of Communication* (Shannon & Weaver, 1949). Shannon and Weaver's model, a telecommunications engineering model, expressed the elements of the model as "source-transmitter-message-channel-receiver-destination." Somewhat concurrently, Lasswell (1948) developed a parallel sociological model based on his earlier work (1927) about propaganda. The Lasswell model used the formula: "*Who* says *what* in what *channel* to *whom* with what *effect*" (1948). Schramm (1954) modified the Shannon-Weaver "source-transmitter" to "sender-encoder" and the Shannon-Weaver "receiver-destination" to "decoder-receiver" to produce the system depicted in Figure A5.

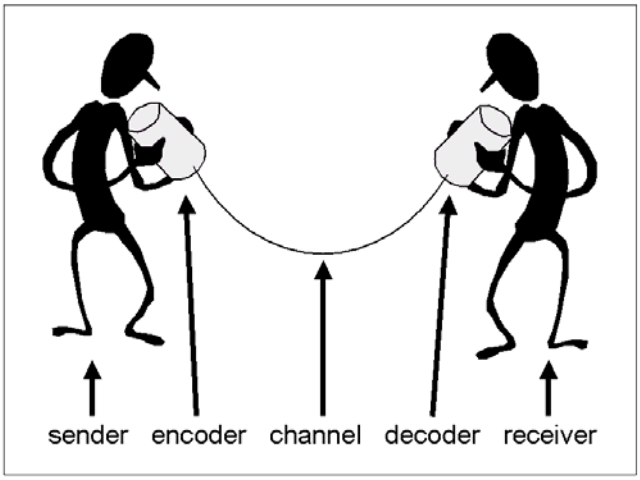

Figure A5: Schramm's communication model of information transfer.

Shannon and Weaver's mathematical theory of communication and the transmission model of communication inspired much discussion and met with

criticism from several sources. For example, some have criticized the model for its unidirectional linearity, a shortcoming that Shannon and Weaver later addressed with the addition of a feedback loop. Some criticized it for its lack of consideration of noise in the channel, a shortcoming also corrected later by Shannon and Weaver.

Further criticisms emerged. Reddy (1993, pp. 176-182) noted that:

> The logic of the [conduit metaphor] framework runs like threads in many directions through the syntactic and semantic fabric of our speech habits.… [O]f the entire metalingual apparatus of the English language, at least seventy percent is directly, visibly, and graphically based on the conduit metaphor. (pp. 176-177)

Therefore, implies Reddy, Shannon and Weaver reacted to a pervasive, irresistible schema, and others, reading Shannon/Weaver, interpreted the Shannon/Weaver model in light of this schema. Reddy continues:

> As soon as people ventured away from the original, well-defined area of the mathematics, and were forced to rely more on ordinary language, the essential insight of information theory was muddled beyond repair [by the distorting influence of the conduit model on ordinary language]. (p. 182)

Reddy also noted the confusion generated by Shannon/Weaver's use of "message" (Shannon & Weaver, 1949, p. 7) versus their use of "signal" (p. 7) and "meaning" (p. 4). MacKay (1969) objected to the Shannon/Weaver definition of information independent of meaning, but readers of Shannon remember that Shannon specifically avoided the concept of meaning in his model (Weaver expressed ambivalence about meaning). Cherry (1966, pp. 214-219), referring to the misuse of the concept of entropy, objected to the application of this model,

designed for engineering applications, to human communication. Shera (1983, p. 385), decrying the subordination of purpose to process, stated: "Librarians would do well to remember occasionally [Michelangelo's] *Moses* or a *Pietà* and think somewhat less frequently of Shannon and Weaver."

In spite of its alleged shortcomings, this model has gained some acceptance in Library and Information Science (LIS) and in cognate disciplines. For example, the model is "widely accepted as one of the main seeds out of which Communication Studies has grown" (Fiske, 1982, p. 6). Further, this study did not rely on the concepts suggested by Reddy, MacKay, Cherry, and Shera, concepts such as "meaning," "message," "noise," "feedback," "destination," and "process." In other words, had this study employed the transmission model depicted in Figure A5, it would have required only the five components of the model depicted in Figure A5, and that model would have provided an adequate and extremely useful graphical conceptualization of CNI.

To develop the taxonomy below, I placed 22 conditions leading to CNI in locations in Figure A5, based on my familiarity with CNI. For example, authoritarian control (1) appears to emanate primarily from the sender and to depend upon the encoding employed by sender. Environmental and social barriers (2 and 3) narrow the channel of communication. Conditions 4 through 22 appear to me to be barriers against the accurate decoding of a communication, with conditions 4-10 lying closer to the sender/encoder, and conditions 11-22 lying a bit closer to the receiver. This taxonomy would require much further

thought before being useful to this study, but it does illustrate the possibility of other taxonomies for conditions leading to CNI.

Sender/Encoder (elements 3.1 to 3.5 and 3/6 to 3.8 of Figure 1.1)

1 Authoritarian control: Censorship/selection, misinformation, or disinformation by an authority; Tacit approval or disapproval by an authority; Explicit approval or disapproval by an authority; Enforcement by an authority: reward & punishment

Channel (element 2 of Figure 1.1)

2 Environmental barriers unrelated to abilities, for example, geographical isolation, bad systems

3 Societal barriers: lack of economic, cultural, or social capital, for example, race, physical appearance, advanced age, gender prejudice

Decoder (elements 1.3, 5.3, 5.4, and 6.2 of Figure 1.1)

4 Affect/emotion/mood

5 Mismatched intelligences, for example, Eidetic v symbolic imagery

6 Fear of the unknown

7 Avoidance of cognitive dissonance

8 Attribution theory

9 Selective memory

10 Priming (selective acceptance of expected information)

Receiver (elements 1.1, 1.2, 5.1, 5.2, and 6.1 of Figure 1.1)

11 Homeostasis, habituation

12 Neuro-chemical mandates (e.g., drugs, alcohol, neuro-chemical pathology)

13 Somatic pathology, for example, traumatic amnesia

14 Somatic barriers related to abilities, for example, disposition based on personality or gender, physical impairment, advanced age

15 Creativity/originality promoting nonuse via engrossment & dissociation, or association

16 Threshold knowledge shortfall, such as inability to locate information, naïve conceptions

17 Psychological engrossment, attention, and distraction

18 Principle of Least Effort

19 Desire for disengagement

20 Resignation

21 Avoidance of overload

22 Information filtering elements

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